

## AN EXPERIMENTAL STUDY AND COST AND ECONOMICAL ANYALSIS OF CONCRETE WITH CEMENT REPLACEMNT OF SILICA FUME AND CORASE AGGREGATE AS WASTE BLACK DUST AGGREGATE

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### ABSTRACT

These days, concrete are the most adaptable structure materials because it can be designed to survive the harshest environments while taking on the most encouraging forms. In the present scenario most, concrete mixture contains additional cementitious material which forms element of the cementitious element. The main advantage of supplementary cementitious material is their capability to replace certain amount of cement and still capable to present cementitious property, as a result reducing the cost of using Portland cement. The waste materials which can be used as additional cementitious material like fly ash, silica fume, blast furnace, steel slag etc. From all these waste materials the most successful cementitious material is silica fume because it improves the strength and durability of concrete to such level that recent design rules identify for the addition of silica fume for design of high strength concrete. Silica fume is also known as micro silica; it is used as an artificial pozzolanic super plasticizer. Now days the high strength and high-performance concrete is extensively used in much civil engineering structure. To reduce the amount of cement in concrete supplementary material are used. Silica fume is most popular material used in the concrete to improve its compressive, strength. The present work focuses on replacement of silica fume proportions 0, 5, 10, 15, 20 percent with cement and coarse aggregate with recycled black marble aggregate with proportions of 0, 10, 20, 30 and 40 percentages respectively

### INTRODUCTION

Concrete plays the most prominent role in the structural construction works, it is the most widely used as a construction material throughout the world. Based on the global usage, concrete is placed at second position over water. It plays a very significant role in the shaping our environment and sustainability of the construction industry. Ever since its discovery has become indispensable in construction practices, owing to its durable, reliable and workable properties. The name concrete is derived from the Latin term "concretus" meaning „grows together“ hinting at the chemical hydration process that causes the material inside to grow together from a visco-elastic state into a hard, dense and durable product. There are numerous plans of solid, which give differing properties, and cement is the most-utilized man-made item on the planet. Concrete is broadly utilized for making design structures, establishments, block/square dividers, asphalts, spans/bridges, motorways/streets, runways, stopping structures, dams, pools/supplies, channels, as footings for establishments, fences and shafts and even vessels. The utilization of cement, the world over, is twice as much as steel, wood, plastics, and aluminum consolidated. Concrete's use in the modern world is going to increase day by day. In the United States alone, concrete production is around a \$30 billion business, every year, considering just the estimation of the ready-mixed concrete sold every year. It is expected that, in the coming years, the requirement of concrete exceeds the present-day demand. In the present years, the growth in the structural construction and the consequent increase in consumption have led to the fast decline of available natural resources. On the other

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## ASSESSMENT OF HIGH-PERFORMANCE BIOLOGICAL CONCRETE PREPARATION

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Concrete is now used more frequently in the construction business. In addition to the growth of the concrete manufacturing business, the introduction of mineral resources used as admixtures in cement has expanded significantly due to cost savings, energy savings, environmental protection, and supply management issues. However, pressure has grown to restrict cement use when using other materials due to environmental concerns, including the impact from raw material exploitation and CO<sub>2</sub> generated during cement production. Therefore, by adopting a selective microbial plugging procedure, a novel technique has been devised. One such idea resulted in the creation of a particularly unusual concrete called Bacterial Concrete, which uses bacteria to promote the repair the faults of mortars and concrete. In this study, Bacillus Sphaericus bacteria of concentration 1x10<sup>6</sup> cells/ml are used. The properties of control concrete and bacterial concrete are studied by conducting various tests such as compressive strength, split tensile strength, flexural test with varying grades of concrete M20, M25, M30. This study showed a significant increase in the strength was observed due to the addition of bacteria for a cell concentration of 10<sup>6</sup> cells per ml of mixing water and therefore calcium carbonate precipitation deposited in micro cracks.

**Key Words:** Bacillus pasteurii, Bacillus sphaericus, Escherichia coli, Bacillus subtilis.

### INTRODUCTION

Concrete is the most often utilized substance in our planet after water. In contrast, when a broad range water decreased or super plasticizer has been developed and has begun to be utilized to minimize the ratio of water to cement (w/c) or water to binder (w/b), on the other side there are some more improvement in the characteristics, like high fluidity, high elastic modulus, high flexural strength, low permeability, increased abrasion resistance, and good toughness. It has assisted in the advancement of HPC. The most recent development in the field of concrete. It is the one of the famous in now a days and it is utilized in many modern projects, like nuclear power plants, flyovers, multi-storey buildings, etc. HPC has become very common in construction works since the 1990s[2]. At present, the utilization of HPC has spread worldwide. In 1993, the American Concrete Institute (ACI) published a broad description of HPC and describes it as a concrete that satisfies unique performance and equality criteria that can't constantly be meet by using only traditional materials and mixing, Practices of positioning and treatment [3]. Quality criteria can include enhancement of segregation-free positioning and compaction, long-term mechanical properties, early age efficiency, reliability, volume stability, or service years in harsh environments. The bacterium-based method includes the utilization of bacillus ureolytic bacteria in the production of calcium carbonate minerals [4]. Metabolism of this bacterial organism involves enzymatic urea hydrolysis of NH<sub>3</sub> and CO<sub>2</sub>. The reaction also induces an rise in pH from acidic to alkaline states producing bicarbonate and carbonate ions precipitating calcium ions in concrete to form calcium carbonate minerals. Further crystallization of the fixes the pores and cracks of the concrete [5].

### II. PREPARATION OF BACTERIAL CONCRETE

Bacterial concrete refers to a new generation of concrete in which selective cementation by microbiologically-induced CaCO<sub>3</sub> precipitation has been introduced for remediation of micro cracks. As in those studies bacteria were manually and externally applied to existing structures, this mode of repair cannot be categorized as truly self healing. In several follow up studies there is possibility is to use viable bacteria is sustainable and concrete embedded self healing agent was explored.

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## MITIGATION OF MAGNETIC INRUSH CURRENT IN A SINGLE PHASE TRANSFORMER USING VOLTAGE SOURCE CONVERTER

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### ABSTRACT

In a power system, transformers are critical components for electrical energy transfer. The transformer is a static device that uses mutual induction between the windings to transfer electrical energy from one circuit to another without using any direct electrical connections. It transfers power from one circuit to another at varying voltage levels without affecting the frequency. The transformer will draw a large amount of current when it is switched on which is known as transient inrush current. A transient current up to 10 to 50 times greater than the rated transformer current can flow for several cycles when a transformer is first energized. Any rapid changes in the magnetizing voltage cause a magnetizing inrush current in the transformer. The magnitude of this current is determined by several factors, including the supply voltage switching instant, residual flux, the transformer core's hysteresis characteristics, the primary circuit impedance, and so on. The system is disrupted by the magnetizing inrush current, which destroys the transformer windings. Inrush current must be lowered to improve this scenario. This project will look at inrush current limiters, which are used to reduce inrush current when a transformer is switched on. Inrush current limiters such as voltage source PWM converter are employed in this application. The simulation is run in MATLAB, and the results are tabulated.

**Keywords:** Transformer inrush current, Core saturation, Residual flux, PWM converter.

### 1. INTRODUCTION

A power transformer is a type of electrical power system component that is extremely expensive and essential. If a power transformer develops a malfunction, it must be removed from operation as soon as feasible to limit the damage. Transients are one of the most common anomalies in transformer circuits. A transient is a brief surge in voltage or current lasting less than 10 microseconds. The transformer runs inefficiently as a result of transients, and the temperature of the transformer windings rises above the tolerable limit, causing damage to the transformer [1,2]. Transients must be suppressed in order to solve the problems they cause.

The usage of power electronic converters to reduce transformer inrush current is explored in this work.

### 2. ANALYSIS OF MAGNETIZING INRUSH CURRENT

There are two sorts of transients in power transformers. Transients that occur both internally and externally in a transformer. Switching procedures cause external transients [3]

There are three forms of internal transients.

Magnetizing inrush current

Internal fault

Over excitation

**Magnetizing inrush current**

Any abrupt shift in the magnetizing voltage causes a magnetizing inrush current in the transformer. The inrush current waveform is rich in harmonics and has a substantial and long-lasting DC component [5]. It can reach huge peak levels (up to 30 times the rated value) at first, then slowly decays for a few tenths of a second before fully decaying after several seconds. Figure 1 depicts a typical inrush current waveform. It

## SIMULATION AND IMPLEMENTATION OF SOLAR PV BASED MULTILEVEL INVERTER FOR BLDC MOTOR DRIVE

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### ABSTRACT

BLDC motor's simple design and great efficiency, as well as its minimal maintenance and cheap cost, these are frequently utilized in high power & low voltage applications. They also have a high-power output and a high torque per unit volume. The BLDC motor operates on an alternating current source, despite the fact that it is a DC motor in this case, the BLDC motor is powered directly from the AC supply port; however, the primary disadvantage is that any interruptions in the source will have an influence on the applications that rely on BLDC motors in the industrial setting. As a result, there should be a converter and an inverter medium between the motor and the source in order to prevent this. There are three different methods to drive the BLDC motor. 1. Two-level inverters build on Pulse Width Modulation (PWM). 2. Inverter with several levels of operation. 3. Multilevel inverter with neutral clamping. By using the multicarrier PWM approach, the suggested inverter may minimize the harmonic content of the output signal. It is capable of generating high-quality motor currents. Using a three-level diode clamped multilevel inverter, the speed of a BLDC may be accurately regulated in this application.

The primary goal of this study is to demonstrate how to operate a BLDC drive with an inverter, where the harmonics may be decreased by utilizing an inverter. The diode clamped multi-level inverter is a device that converts voltage into current. This research provides a more effective alternative to this practice. By simulating the performance of the neutral clamp multilevel inverter-based drive system that use the MATLAB Simulink software package, it is able to assess the overall efficacy of the system. In the event of a power loss, the whole application will cease to function and provide output. Consequently, under these circumstances, in order to increase the dependability of electricity supply and production, it should turn to renewable energies. Different renewable energy sources are available; however, solar PV system instead of conventional power supply because of its benefits have to choose, and a diode clamped multi-level inverter was utilized to drive the BLDC.

**Keywords:** BLDC, Multi-level Inverter, Neutral Point Clamped Diode, THD, Multicarrier PWM, firing circuit.

### 1. INTRODUCTION

There are numerous advantages to using a BLDC motor, including high efficiency, low maintenance requirements, reduced weight, and a much more compact design. Because of its inherent advantages, BLDC motors have indeed been extensively employed in a variety of industrial applications for many years. As a result of their great efficiency and the fact that they can be regulated easily across a broad speed range, they are the most ideal motors for applications needing rapid dynamic response in speed response. Motor drive topology built on Multi-Level Inverter (MLI) technology are becoming more prevalent in the motor drive industry. Three-level topologies have the advantage of allowing multilayer voltage waveforms to be created with equipment with reduced voltage rating, which would be a considerable benefit. The objective of multilevel inverters is to generate sine values using discrete voltage levels, whereas the purpose of Pulse Width Modulation (PWM) approaches is to generate sinusoids with changing voltage and frequency, respectively. Multilevel inverters are used to generate sinus voltages from discrete voltage levels. By delivering different gate signals to the MOSFETs, it is possible to produce sinusoids with three phases for a variety of voltages. PWM for inverters has been implemented using a variety of ways that have been



## TRACKING OF EFFECTIVE SUNLIGHT FOR INCREASING POWER GENERATING EFFICIENCY IN CHARGING STATIONS

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### ABSTRACT

The globe has turned its attention to sustainable development and renewable energy as a result of climate changes brought on by global warming and ozone layer depletion. As a result, solar PV systems are now seen as a viable source of energy due to their direct conversion of sunlight into electricity, simplicity of operation, and production of clean energy. The panel land-based PV systems, however, use up a lot of usable land. For the same quantity of energy production, a solar PV pole only needs a small portion of that area of land. It is also more efficient than a land-based system at capturing sunlight. This solar pole aids in tracking the sun and improving the effectiveness of electricity generation.

**Keywords:** solar PV systems, effective sunlight, panel land based PV systems, global warming

### INTRODUCTION

It is a kind of renewable energy source that can compete in some respects with fossil fuels. Hydropower is the term for the kinetic energy of moving water. It produces almost all of the renewable energy in the country. Facilities that produce electricity using hydroelectricity do not harm the environment or use any resources. The thermonuclear fusion process in the sun, a spherical hydrodynamic body of extremely hot ionised gases (plasma), produces energy. The interior of the sun, where energy is released by hydrogen and helium fusion, is thought to be between 8 and 40 degrees Kelvin in temperature. Solar energy is usually recognised as the easiest and cleanest way to produce renewable energy due to its abundance and simplicity. solar architecture, solar photovoltaic, and solar thermal are the approaches for direct conversion of solar radiation into useful form. The biggest issue with harnessing solar energy is the need to install massive solar collectors, which necessitates a lot of room. To solve this problem, we may set up an Arduino-based photovoltaic charging station that takes up very little space. Solar panels are installed on the roof. Solar panels convert sunshine into electric energy, which is subsequently used to charge batteries in phones, laptops, and other electronic devices, as well as for street lighting. Its appealing and modern design will blend seamlessly with our campus's public areas, allowing all students and guests to freely use its resources. Along with the promotion of renewable energy sources. The employment of energy saving technology, such as LED street lighting, is also promoted via an Arduino-based charging station powered by photo voltaics.

### ENERGY SCENARIO

In order to get a good sense of what these non-conventional sources of energy are and how much of an impact they have on our lives, it's a good idea to get a sense of conventional sources of energy, to see what we're calling conventional sources of energy and how prevalent they are and to what extent we're impacted in our lives because of these sources of energy. So, to begin, I've put together a little bit of a timeline, which I think is very interesting to see for a variety of reasons, the most important of which is that as we talk about conventional sources of energy, I think this timeline will convey to you what time frame we're talking about over which these conventional sources of energy have become a very major part of our existence, okay? Of course, it's all occurring because we're using that energy, right? As a result, everything is happening for that reason. So, on some fundamental level, yes, in terms of existing present lifestyle, these oil wells are vital because they support the production of energy, and we, the general public, use that energy. Because

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### INTRODUCTION

It is a kind of renewable energy source that can compete in some respects with fossil fuels. Hydropower is the term for the kinetic energy of moving water. It produces almost all of the renewable energy in the country. Facilities that produce electricity using hydroelectricity do not harm the environment or use any resources. The thermonuclear fusion process in the sun, a spherical hydrodynamic body of extremely hot ionised gases (plasma), produces energy. The interior of the sun, where energy is released by hydrogen and helium fusion, is thought to be between 8 and 40 degrees Kelvin in temperature. Solar energy is usually recognised as the easiest and cleanest way to produce renewable energy due to its abundance and simplicity. solar architecture, solar photovoltaic, and solar thermal are the approaches for direct conversion of solar radiation into useful form. The biggest issue with harnessing solar energy is the need to install massive solar collectors, which necessitates a lot of room. To solve this problem, we may set up an Arduino-based photovoltaic charging station that takes up very little space. Solar panels are installed on the roof. Solar panels convert sunshine into electric energy, which is subsequently used to charge batteries in phones, laptops, and other electronic devices, as well as for street lighting. Its appealing and modern design will blend seamlessly with our campus's public areas, allowing all students and guests to freely use its resources. Along with the promotion of renewable energy sources. The employment of energy saving technology, such as LED street lighting, is also promoted via an Arduino-based charging station powered by photo voltaics.

### ENERGY SCENARIO

In order to get a good sense of what these non-conventional sources of energy are and how much of an impact they have on our lives, it's a good idea to get a sense of conventional sources of energy, to see what we're calling conventional sources of energy and how prevalent they are and to what extent we're impacted in our lives because of these sources of energy. So, to begin, I've put together a little bit of a timeline, which I think is very interesting to see for a variety of reasons, the most important of which is that as we talk about conventional sources of energy, I think this timeline will convey to you what time frame we're talking about over which these conventional sources of energy have become a very major part of our existence, okay? Of course, it's all occurring because we're using that energy, right? As a result, everything is happening for that reason. So, on some fundamental level, yes, in terms of existing present lifestyle, these oil wells are vital because they support the production of energy, and we, the general public, use that energy. Because

## TRACKING OF EFFECTIVE SUNLIGHT FOR INCREASING POWER GENERATING EFFICIENCY IN CHARGING STATIONS

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### ABSTRACT

The globe has turned its attention to sustainable development and renewable energy as a result of climate changes brought on by global warming and ozone layer depletion. As a result, solar PV systems are now seen as a viable source of energy due to their direct conversion of sunlight into electricity, simplicity of operation, and production of clean energy. The panel land-based PV systems, however, use up a lot of usable land. For the same quantity of energy production, a solar PV pole only needs a small portion of that area of land. It is also more efficient than a land-based system at capturing sunlight. This solar pole aids in tracking the sun and improving the effectiveness of electricity generation.

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## IMPROVING ALUMINUM ALLOY'S ULTIMATE FRICTION STIR WELDING FOR SANDWICH MAKING

<sup>1</sup>K.Suresh, <sup>2</sup>K Swathi, <sup>3</sup>M Manasa Priyadarshini, <sup>4</sup>Kothi Kiran Kumar  
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### ABSTRACT

In this study, a pure copper foil was sandwiched between two sheets of the aluminum alloy Al5052-H32 to form a multi-lap junction using the friction stir welding (FSW) technique. The great strength and capability for heat tolerance of the tool material M2HSS are taken into consideration. This paper employs the L9 technique of the Taguchi method. All samples are put through an ultimate shear strength test. In the instance of AlA-Cu-AlA welds, it has been shown that the parameters of tool rotation speed at 800 rpm, traverse speed at 5mm/min, and plunge depth at 0.2 mm produce the highest values of the ultimate tensile strength. We know that, the AlA-AlA joint has a greater value of the ultimate shear strength when compared to AlA-Cu-AlA joint. It is also observed that the clamping also plays an important role in friction stir welding.

**Keywords:** Friction Stir Welding, Thin Sheets, Multi-lap Joint, M2HSS tool, Dissimilar Material Welding, Solid State Welding Process efficiency.

### 1. INTRODUCTION

Since the FSW method is a sort of solid state welding, the material does not have to reach its melting temperature in order for the junction to be produced [1-2]. In order to construct a junction, a tool must be used to apply force in a downward direction while simultaneously rotating to mix the base ingredients at a temperature just hot enough to plasticize the material [3,4]. The frictional force between the rotating tool and the base material surface in contact with the tool causes heat to be produced. [5] Less HAZ (heat affected zone) is produced at temperatures that are substantially lower than the melting points of the basic materials, which has a smaller impact on the initial material qualities [6].

The FSW was invented in 1991 at 'The Welding Institute (TWI)' when Wayne Thomas used a tool having a probe with the correct rotational speed and torque [7, 8]. The tool selected had hardness greater than that of any of the base materials [9]. FSW could be utilized for joining similar as well as dissimilar materials. However, only lap and butt arrangement of sheets is feasible while making a joint [10]. Several samples of the multi-lap joint consisting of two dissimilar materials had been evaluated for their shear strengths. The thickness of the sheets used was relatively lesser (i.e., 1 mm each for Al5052-H32 and 0.1 mm for pure copper) than the thickness of sheets that are usually joined with the FSW process [11,12,13]. The scanning electron microscopy was performed on the friction stir welded AlA-Cu-AlA sample having the highest value of the ultimate shear strength by carbon-coating the sample. The copper clad aluminium tubes which are excellent heat sinks can be fabricated using the process discussed in this paper, while keeping their weight to the minimum since no extra filler material is used in the discussed joining process [14].

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## EVALUATION OF EPOXY-GLASS FIBER COMPOSITE LAMINATE'S FRACTURE TOUGHNESS

<sup>1</sup>K.Prahalad Reddy, <sup>2</sup>P Kiran Kumar, <sup>3</sup>B Narendar, <sup>4</sup>Chepyala Bhikshapathi  
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### ABSTRACT

High technology applications like those in space do not work well with ordinary materials. To satisfy the demands of high temperature and wear resistances, research is ongoing. In this study, the glass fiber reinforced epoxy composite laminar is made for testing. Applications for composite materials have grown as a result of their improved fatigue properties and high strength/stiffness for lower weight. There are problems like inter-ply cracking, inter-laminar delaminating, and fiber cracking at the same time. By making composite materials more fracture robust, failure may be decreased. Evaluation of the glass fiber/epoxy composites' fracture toughness is the goal of our investigation. The composites are prepared with a glass fiber reinforced with epoxy based polymer. Fracture toughness of the specimen is used to conduct mode-I fracture test using special loading fixtures as per ASTM standards.

**Keywords:** ASTM standards, Glass Fiber, Fracture Toughness,

### 1. INTRODUCTION

It is unnecessary to highlight the importance of engineering materials in the creation of modern technologies. The materials are the means by which a designer brings his concepts forward and into action.

These materials were anticipated to exhibit a number of performance qualities. As follows:

Materials must have a mix of qualities for a particular purpose since current technological products work in a unique environment.

Extreme conditions include those that are extremely hot (up to 2500°K), cold, vacuum-like, and high hydrostatic pressure (as in deep sea).

The traditional material might not always be able to satisfy customer needs.

In order to achieve these performance criteria, new materials are being produced, and as a result, composite materials from one class of materials were developed.

### 2. LITERATURE REVIEW

As previously mentioned, scientists are tackling the issues of inter-ply cracking, de-lamination, and fibre cracking. The purpose of this research is to forecast the degree of fracture propagation in a FRP composite laminate that has been exposed to known and finite stresses. The contrast between conventional materials and fibre composites is explained to Chamo. All potential fracture modes, the kinds of defects they start, and the coalescence and propagation of these flaws to critical dimensions for

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## A SIMULATION OF FIRE-TUBE BOILER FLOW CHARACTERISTICS USING ANSYS

<sup>1</sup>N.Sandeep Kumar, <sup>2</sup>M.surendar, <sup>3</sup>Srinivas Balasani, <sup>4</sup>Guguloth Naveen  
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### ABSTRACT

The thermal analysis of the fire-tube boilers used in thermal power plants is covered in this study. For simulation purposes, a small-scale prototype of the original fire-tube boiler created using Solid Works is employed. The designed model's numerical simulation is performed using ANSYS Fluent. The pressure and temperature fluctuations along the length of the boiler for various water velocities, such as 25 m/s, 30 m/s, 35 m/s, and 40 m/s, are shown in the opening section of this work. The latter portion examines pressure and temperature fluctuations at constant water velocity of 30 m/s while dealing with various boiler casing materials, including steel, brass, and stainless steel. The best boiler shell material out of these three has been picked after considering the results. The result has been obtained from the CFD analysis and is presented in the form of pressure and temperature contours.

**Key words:** Fire Tube Boiler, Numerical Analysis, ANSYS Fluent, CFD Analysis, Negative Heat Flux, Pressure-Velocity Variation.

### 1. INTRODUCTION

Boilers are pressure vessels that heat water or produce steam for industrial heating systems and to turn steam turbines to produce power. In a thermal power plant, a boiler is a closed vessel that generates heat to facilitate fuel combustion [1]. Hot gases or flue gases move through the boiler tubes in a fire tube while the water is sent outside in the shell. By transferring heat from gases to water, water is heated to a high temperature [2]. The walls of the boiler experience considerable strains if they are exposed to high temperature and pressure conditions [3]. The primary parts of a boiler are made by the high-temperature alloys such as steel, cast iron, stainless steel etc. The failure in the boiler generally affects the output of the overall power plant. Identifying the correct failure reason often helps to ensure integrity of the component. There are many reasons due to which boiler failure occurs such as pitting, stress corrosion cracking, stress rupture, creep, erosion and thermal fatigue [4].

In the Pulverized coal-fired boiler, the flue gases temperature can reach up to the 1200°C and it contains fly ash that induces the erosion [5]. In present, the boilers have to completely isolated from the external environment for the proper functioning. So, methodologies based in the computational simulations have been used to analyze effect of velocity on boiler function. Nowadays, the computation analys is isused instead of prototype.

### 2. FORMULATION AND SOLUTION METHODOLOGY

The small-scale proto type of the fire-tube boiler was designed using Solid Works. The individual parts, i.e. the boiler shell, water flow domain, fire tubes and exhaust flow domain, were designed individually and then assembled to get the final model. The assembly of the fire-tube boiler was saved as .STEP file to import it in

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### ABSTRACT

This work presents a thorough examination of the thermo-physical characteristics and the heat transmission mechanism of nano-fluids. In-depth discussion is given on various nanofluid fabrication methods, heat transport mechanisms, and their thermo-physical characteristics. We already know that factors like the Brownian motion of the particles, the molecular stacking of the liquid-particle interface, and the clustering of the nanoparticles all affect heat transmission in nanofluids. Additionally, there is a significant impact of metal oxide nanoparticles on the improvement of nanofluid heat transfer. It is also well known that coolants have significant thermal conductivities even at low nanofluid volume concentrations. The size, volume concentration, form, and substance of nanofluids all affect their thermal conductivity and viscosity. The composition of the nanoparticles determines whether the viscosity of nanofluids increases or decreases. It is also observed that the viscosity of nano-fluid increases with increase in volume of nano particle.

**Keywords:** Nano particles, Nano- fluid, Thermal Conductivity, Viscosity, Volume Concentration, Heat Transfer.

### 1. INTRODUCTION

Because natural resources are finite and quickly dwindling, it is crucial to maximise efficiency. Due to resource constraints, space restrictions, and other factors, the majority of industries struggle with the serious issue of heat transfer augmentation of thermal systems. The main issue is how to disperse the heat produced by electronic devices because they are made in lower amounts in the electronic industry. As a result, increasing effort is being put into increasing heat transmission rate. A popular topic of research is reducing energy waste by enhancing heat transfer efficiency. Traditional fluids with low thermal conductivity are utilised for heat transmission. Heat transport across expanded surfaces is already at its maximum rate. Therefore, we need to look for alternatives to achieve our objective. Nano fluid is looks to fill this gap and have been the recent advancement to increase heat transfer. Fluids with nano particles (diameter less than 100 nm) suspended in conventional fluids are called Nano fluids. Proper dispersion of nano particles into base fluid forms stable Nano fluids this exhibits several beneficiary features. The introduction of few nano particles in the base fluid increases thermal conductivity of the base fluid significantly. Their enhanced thermal conductivity in-turn can improve the heat transfer rate and energy efficiency in various fields like defence, transportation, space, power generation etc.

### 2. NANO FLUID PREPARATION

The preparation of Nano fluid is the first step for experimental studies. Nano fluid consists of metals, carbides, oxides and carbon nano tubes well dispersed in conventional fluids. Researchers are studied and used a two-step process to produce nano-tubes via inert gas condensation process [1-2]. This process involves the vaporization of a source material under vacuum conditions. An advantage of this technique is that nano particle agglomeration is minimized. The disadvantage is that only low vapour pressure fluids are compatible with the

## OBSERVATION BASED ON VISCOSITY OF NANO FLUID WHILE INCREASING THE VOLUME OF NANO PARTICLES

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## CMOS-BASED MULTI-BIT DIGITAL COMPARATOR PERFORMANCE ANALYSIS

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This paper presents the creation and analysis of various comparators like EXOR/EXNOR. The comparator's structure can be divided into two techniques or modules. The Comparison Evaluation Module (CEM) is the first technique/module, while the Final Module is the second technique/module (FM). The parallel prefix tree structure used by the Comparison Evaluation Module (CEM) is designed to execute a bitwise comparison of two N-bit operands, A and B. Based on the output of the Comparison Evaluation Module, the Ultimate Module (FM) is meant to provide the final outcome (CEM). To obtain the results of multiple comparators utilizing the 45 nm complementary metal oxide semiconductor (CMOS) technology, simulation results are evaluated using the LTspice software. The performance of the multiple comparators like EXOR/EXNOR is analyzed by calculating the total delay, number of transistors in the comparator, power dissipation and current value.

**Keywords:** Comparators, AND Gates, NAND Gates, NOR Gates, EXOR Gates, EXNOR Gates.

### 1. Introduction

The key design component for applications in which the comparison of the outputs of a comparison evaluation module yields the final results is a digital comparator. Numerous applications exist, including scientific ones like digital image processing, pattern recognition/matching arithmetic sorting, data compression, and applications like digital neural networks and test circuits. The memory addressing logic, queue buffers, and test circuits in computer architecture are all developed using the digital comparator design as a major component. The more the comparator's logic is used in various computation-based designs, the more area, power, and speed may be optimized. Some comparators are designed using dynamic logic to achieve low power consumption; however the restriction of low speed and inadequate noise margin makes the design difficult. The digital comparator logic structure is designed using various logic gates. A logic gate is a device that acts as building block for digital circuits. There are seven basic logic gates such as, AND gate, OR gate, NAND gate, NOR gate, EXOR gate, EXNOR gate and NOT gate. The digital comparator structure uses the NAND, NOR, AND, EXOR and EXNOR logic gates. To perform digital comparator the logic gates EXOR and EXNOR plays an important role. There are many applications of EXOR gate such as it is used in Arithmetic operations, Parity Checker, Controlled Inverter, Binary to grey conversion, Combinational logic circuits minimization and digital comparator. The performance of digital comparators is analyzed by using different EXOR and EXNOR logic gates in digital



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## IOT-BASED CONCEPTION AND CREATION OF A SMART IRRIGATION SYSTEM

<sup>1</sup>G. Ramakrishna, <sup>2</sup>V.Ganesh, <sup>3</sup>M Shamini, <sup>4</sup>K.Naga Durga Devi

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### ABSTRACT

In India, people's primary source of income is agriculture. It is important to the nation's economy. The last ten years have seen a remarkable growth in this area of technology. A huge agriculture large-scale firm is the foundation for the precision research currently being conducted in American agriculture. However, small farmers lack the funds to purchase pricey monitoring equipment. Therefore, IOT (internet of things) technology has revolutionized every aspect of the life of the average person by making everything smart and intelligent in order to overcome these challenges. IOT describes a network of interconnected objects that can self-configure. For usage with GSM and the internet, we created an Arduino-based agricultural monitoring system. The system regulates water flow in accordance with humidity and ambient temperature measurements. The controller activates the relay drive unit when a message is received via GSM and the pump motor by using a relay switch. This design can be used for alerts, user knows moisture content via SMS (Short Message Service) and the temperature exceeds the threshold value.

**Keywords:** IOT, GSM module, Arduino, Wi-Fi module, Sensors.

### INTRODUCTION

One universal Network Device Capability Concept is the Internet of Things. Record and gather information from the environment around us, and then share it online for processing and other amusing purposes. IOT moves quickly become a fact. We can observe evidence all around us. From smart phones to smart TVs, smart cars, and smart kitchens, our equipment will continue to get smarter every day. Nowadays, everything is linked to the Internet.

It describes the Internet of Things (IoT), a network of online physical devices that are interconnected. Objects, or "things," that can transmit information wirelessly and without human work. Any object with an IP address and the ability to transmit data over the Internet can be considered a "thing."

### LITERATURE SURVEY

Various investigations have been conducted on how to improve soil irrigation efficiency. The researchers used different ideas based on soil conditions and water levels. The researchers discuss the design of the different techniques and systems used.

This article aims to reduce the water waste and labor involved in manual watering. The proposed system is designed to measure soil moisture content through sensors placed directly in the soil. These sensors detect the water level on the ground, and if the water level is low, the user will be notified via a message sent to the app, which will be installed on the user's phone [1].

The Arduino board is a microcontroller that controls the digital connections and interactions between objects in the proposed system, allowing object recognition and action [2]. With its powerful on-board processing power,

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### ABSTRACT

This design displays a step-grounded power production scheme employing readily accessible piezoelectric detectors. Since the time when the mortal race first appeared on this planet, they have needed energy at a veritable breakneck pace for both survival and good, and as a result, the power infrastructure has become depleted. Then, we provide an enhanced step power generator system that generates electricity from mortal steps using piezo detectors. The creation of new energy sources is a top priority during this time of technological advancement. Bias that is suited for converting ambient energy into electrical energy is one of the domains that has attracted significant interest. Our idea aims to create a tool that can transform pressure into grounded electrical energy using a piezoelectric element. This design will also show that the presence of waste vibration energy might have some values to be used. The system of this energy generating design includes the conversion of nonstop contraction of bottoms by mortal pressure across piezoelectric accoutrements into electrical energy.

### 1. INTRODUCTION

Electricity has now become a vital resource for the human population. Alternative energy sources and their sustainable use were motivated by worries about the energy gap between supply and demand. A mechanism to generate power from the growing population was developed as a result of the linear increase in the mortal population and the demand for energy.

The ability to perform the task is all that energy is. The most often used energy source in daily life is electricity. The demand for energy is growing today, which is essential for human survival. Due to the large amount of energy resources that are generated from resources like water, wind, etc., it is necessary to develop large industries at a high cost of conservation some other energy coffers are also expensive and generate pollution. Electricity has come important coffers for mortal being hence it's demanded that wasted energy must have to use walking is the most common exertion done by mortal being, while walking energy is wasted n the form of vibration to the face and this wasted energy can be converted into electricity. Using the star called piezoelectric effect. Piezoelectric effect is the effect in which mechanical climate pressure or strain applied to piezoelectric material is converted into electrical form. This design gives about how energy is used on stepping on stairs. The use of stairs in every structure is adding day by day indeed small structures have some bottoms when we're stepping quantum of this wasted energy is employed and converted to electricity by piezoelectric effect. Piezoelectric effect is the effect of specific accoutrements to induce an electric charge in response to applied mechanical stress. Energy harvesting or scavenging is the process of landing the wasted energy from naturally being energy sources, accumulating and storing it for after use.

Now a day's energy is one of the most important issues around the world. Especially in Bangladesh energy extremity is a big problem. Renewable energy sources can be a great media to break this energy extremity problem in Bangladesh. As we know natural resources will finish one day. That's why researchers are trying to introduce cover energy sources from nature. That must be green and not dangerous for the atmosphere. Energy harvesting is defined as acquiring jiff amounts of energy from one or further of the girding energy

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This design displays a step-grounded power production scheme employing readily accessible piezoelectric detectors. Since the time when the mortal race first appeared on this planet, they have needed energy at a veritable breakneck pace for both survival and good, and as a result, the power infrastructure has become depleted. Then, we provide an enhanced step power generator system that generates electricity from mortal steps using piezo detectors. The creation of new energy sources is a top priority during this time of technological advancement. Bias that is suited for converting ambient energy into electrical energy is one of the domains that has attracted significant interest. Our idea aims to create a tool that can transform pressure into grounded electrical energy using a piezoelectric element. This design will also show that the presence of waste vibration energy might have some values to be used. The system of this energy generating design includes the conversion of nonstop contraction of bottoms by mortal pressure across piezoelectric accoutrements into electrical energy.

### 1. INTRODUCTION

Electricity has now become a vital resource for the human population. Alternative energy sources and their sustainable use were motivated by worries about the energy gap between supply and demand. A mechanism to generate power from the growing population was developed as a result of the linear increase in the mortal population and the demand for energy.

The ability to perform the task is all that energy is. The most often used energy source in daily life is electricity. The demand for energy is growing today, which is essential for human survival. Due to the large amount of energy resources that are generated from resources like water, wind, etc., it is necessary to develop large industries at a high cost of conservation some other energy coffers are also expensive and generate pollution. Electricity has come important coffers for mortal being hence it's demanded that wasted energy must have to use walking is the most common exertion done by mortal being, while walking energy is wasted n the form of vibration to the face and this wasted energy can be converted into electricity. Using the star called piezoelectric effect. Piezoelectric effect is the effect in which mechanical climate pressure or strain applied to piezoelectric material is converted into electrical form. This design gives about how energy is used on stepping on stairs. The use of stairs in every structure is adding day by day indeed small structures have some bottoms when we're stepping quantum of this wasted energy is employed and converted to electricity by piezoelectric effect. Piezoelectric effect is the effect of specific accoutrements to induce an electric charge in response to applied mechanical stress. Energy harvesting or scavenging is the process of landing the wasted energy from naturally being energy sources, accumulating and storing it for after use.

Now a day's energy is one of the most important issues around the world. Especially in Bangladesh energy extremity is a big problem. Renewable energy sources can be a great media to break this energy extremity problem in Bangladesh. As we know natural resources will finish one day. That's why researchers are trying to introduce cover energy sources from nature. That must be green and not dangerous for the atmosphere. Energy harvesting is defined as acquiring jiff amounts of energy from one or further of the girding energy



## HOME AUTOMATION SYSTEM WITH GESTURE CONTROL ROBOT WITHOUT TOUCH

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### ABSTRACT

This study suggests a sensor- and microcontroller-based appliance automation system. We combined a single central control section with a sensor network. The network is connected using IR sensors and relays. The sensors and microcontroller will exchange data. The IR Sensor alerts the controller when a person enters a particular zone by detecting his presence. The controller receives data from a particular sensor and sends a signal to a certain relay, which instructs the appliance to switch on or off depending on whether someone is present or not. The demo kit provides a proof of concept for the model. Based on the preset distance the system will work, the range or distance in this automation system is predefined. As it provides a simple topology connection which will indeed help in easy operation and diagnosis of faults. It is pocket friendly. For any smart home, all the devices are to be kept interconnected.

**Keywords** – Automation, Sensor, Smart Home

### 1. INTRODUCTION:

House automation is the management and management of domestic home equipment through the use of microcontroller or laptop technology. These days, automation is well-known for its simplicity, security, and effectiveness. In this, a sensor detects the reputation of household appliances and updates the web server. Even if he is far from the house, a person can access and control household equipment by turning it on and off. Clients can access a neighboring PC. The method of managing household appliances with the use of internet servers will be discussed in this paper [1]. When developing a home automation system, there are a few issues to consider. The system had to be scalable in the offer that the gadgets may be effortlessly set up and monitored and have to be speedy sufficient to realize the real electricity of wireless technology. Finally, the machine had to be value powerful to justify its software in domestic automation [3].

#### *A. Home automation technologies that had existed before:*

Earlier many implementations have been done to home automation systems. However, due to some of the issues that the users are facing, some drawbacks have been identified. To recover these drawbacks, some implementations have been made. [4] developed a ZigBee-based home automation system A ZigBee primarily based domestic automation device and Wi-Fi community is included through a not unusual place domestic gateway. The domestic gateway provides community interoperability, an easy and bendy person interface, and far-off get entry into the device. A committed digital domestic is applied to cater to the device's protection and protection needs. To display the feasibility and effectiveness of the proposed device, 4 devices, a mild switch, radiator valve, protection sensor, and ZigBee far off manipulate were developed and evaluated with the house automation device.

[3] implemented a Bluetooth-based home automation system using a cell phone where the design is completely based on a stand-alone Arduino BT board and the home appliances are connected to the input/ output ports of this board via relays. Password safety is getting used to the handiest permit authorized customers from having access to the home equipment at home.

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## ANALYSIS ON FINGERPRINT SENSOR VERIFICATION FOR WIRELESS CHARGING

<sup>1</sup>L.Vishnu Vardhan, <sup>2</sup>Uma Maheshwari, <sup>3</sup>K.Kiran, <sup>4</sup>Y.Sachin

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### ABSTRACT

The idea is to use wireless signal fingerprints, which are distinctive and difficult to fool with, to identify suspect charges. We create wireless ID, a wireless charging receiver coil in a Smartphone, based on such intrinsic fingerprints. Before the wireless charging pad makes a connection request, the Wireless ID system gathers signals from the receiving coil and delivers them to the trusted cloud server. The server will take the signal's characteristics (or "fingerprint") and compare them to a database of reliable chargers. The system will alert the user about charging on an entrusted wireless charger if a match is not detected and the charger is deemed unknown or untrustworthy. The basic idea of the project into secure wireless charging by establishing a fingerprint for each charger so that before the charging starts, the system will check for the fingerprints that are pre-registered inside the fingerprint sensor and if it matches the mobile will begin to charge. Wireless charging also known as inductive charging or cordless charging, uses an electromagnetic field to transfer energy between two objects via electromagnetic induction. The system design consists of four modules: signal collection, signal processing, device verification, and trusted database management. The signal collection module collects wireless signals before the charging process begins. This verification system enhances the security of your mobile and prevents the battery from getting drained and facilitates effective charging in less duration of time.

**Keywords:** Fingerprint sensor, Detection, Verification, Sensing, Authentication.

### 1. INTRODUCTION

Mobile phones, cordless appliances, and other devices can now be charged wirelessly instead of using a cable, as is generally the case. Any battery-powered appliance's battery is close to a wireless power transmitter when using a wireless charger. The appliance enclosure can be rendered entirely sealed and even water-proof as a result. Since the charging plug on an appliance's side is so rapid and precise, these chargers offer great reliability.

Applications for battery charging without cables can benefit from increased convenience, toughness, and safety. When electrical contacts are prohibited, these chargers can generally be used instead. Particularly when bacterial infusion and electric shocks are more common in wiring charging can also reduce the number of cables and power adapters you need to have custom manufactured for your device or application. Through Wireless charging the various types of charging, issues can also be eliminated and a common charging interface will be available for all the mobile devices.

### 2. FINGERPRINT SENSOR

Fingerprint verification ensures that our device is safe and secure from other external access. In this work we have used an Optical based fingerprint sensor; the sensor detects and creates the fingerprint image by determining the light and dark areas created by the fingerprint ridges after detecting the finger image and transfers to the microcontroller unit i.e., Arduino.

### 3. PROPOSED WORK

## ANALYSIS ON FINGERPRINT SENSOR VERIFICATION FOR WIRELESS CHARGING

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### 3. PROPOSED WORK

## A PROTECTED KEY AGREEMENT-BASED EFFICIENT AUTHENTICATION METHOD FOR MOBILE DEVICES

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### ABSTRACT

Device-to-Device (D2D) trades have gained popularity as a viable alternative to the launch of conventional mobile frameworks due to the rapid growth of cutting-edge cell and tablet users. However, material security concerns about D2D trades have not yet been addressed. In this study, we examine the security requirements and difficulties for D2D communications, and we propose a safe and practical key obtaining demonstration that enables two cells to establish a shared secret key for D2D communications without the need for prior knowledge. The Diffie-Hellman key obtaining show and obligation schemes are the foundation of our theory. Our suggested presentation seems differently from previous work in that it features less upward computation and correspondence. We discuss the planned show's design details and security analysis.

**Keywords:** D2D interchanges, Diffie-Hellman, Wi-Fi Direct, key understanding convention.

### INTRODUCTION

By connecting to the Internet and downloading programmers, individual mobile phones, like PDAs and tablets, are becoming more and more common, which places a significant burden on the cell network's infrastructure. Device-to-Device (D2D) interchanges are known for shifting the burden of traffic from the cellular infrastructure to individual devices [1]. Without using the public cell network or corridors, D2D technology enables cell phone users to easily establish remote connections with one another.

Numerous written works have focused on the possible specialized solutions and application scenarios for D2D exchanges. The authors of [1] introduce a component for coordinating D2D exchanges into LTE-Advanced organization and suggest D2D correspondences as an underlay to the cell organization. Yu et al. [2], [3] examine the power control issue for D2D interchanges, and infer an ideal power portion for D2D joins under cell network control. The work in [4] proposes to utilize Wi-Fi based D2D joins among cell clients to further develop the general organization execution in uplink transmission.

Wi-Fi Direct, at first called Wi-Fi P2P, is a Wi-Fi standard that empowers gadgets to handily set up D2D associations utilizing the Wi-Fi recurrence band. [5] Gives a wide outline and trial assessment of the Wi-Fi Direct convention. [6] Considers the viable execution difficulties of Wi-Fi Direct and shows that the Wi-Fi Direct highlights permit conveying the D2D worldview on top of the LTE cell foundation. However D2D correspondence has been a hot examination point lately, there isn't a lot of study zeroing in on the security part of D2D interchanges. and [11] talk about the actual layer answers for secure D2D correspondences, yet their procedures are hard to be carried out utilizing gadgets available.

Indeed, because of the transmission idea of remote correspondence, remote channels are viewed as defenseless against an assortment of assaults, and security is one of the central issues for D2D interchanges. To get the correspondence between two end clients of a D2D connect, setting up a common mystery key is the first and most critical stage. Nonetheless, absence of believed outsider and foundation under D2D association climate makes this stage a non-paltry assignment. The notable Diffie-Hellman key understanding convention empowers two gatherings mutually set up a common mystery key with no earlier information. In any case, this convention is helpless against the man-in-the-center assault (MITMA) [12]: a functioning foe makes

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## Dynamic Searchable Symmetric Encryption over Medical Cloud Data: Secure and Efficient Achievement

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**Abstract:** In medical cloud computing, a patient can remotely outsource her medical data to the cloud server. In this case, only authorized doctors are allowed to access the data since the medical data is highly sensitive. Encrypting the data before outsourcing is a commonly used approach, where the patient only needs to send the corresponding encryption key to the authorized doctors. This, however, significantly limits the usability of outsourced medical data due to the difficulty of searching over the encrypted data. In this paper, we propose two Secure and Efficient Dynamic Searchable Symmetric Encryption (SEDSSE) schemes over medical cloud data. Firstly, we leverage the secure k-Nearest Neighbor (kNN) and Attribute-Based Encryption (ABE) techniques to propose a dynamic searchable symmetric encryption scheme, which can achieve two important security features, i.e., forward privacy and backward privacy which are very challenging in the area of dynamic searchable symmetric encryption. Then, we propose an enhanced scheme to solve the key sharing problem which widely exists in the kNN based searchable encryption scheme. Compared with existing proposals, our schemes are better in terms of storage, search and updating complexity. Extensive experiments demonstrate the efficiency of our schemes on storage overhead, index building, trapdoor generating and query.

**Keywords:** Artificial intelligence, deep learning, E-government, web services.

### I. INTRODUCTION

Health care service has been extensively studied to improve medical quality and reduce the cost of medical services [1], [2]. With a large amount of medical data, a health care system must extend its scale to provide efficient and secure services [3]. Media cloud computing, which treats computing as a utility, leases out the computing and storage capacities to the public patients and doctors. It is a revolutionary computing paradigm which enables dynamic resource allocation, selfdemand services, measurement of service, transparency of resource, etc [4]. As such, a patient can remotely store her data on the cloud server, namely data outsourcing, and then open her cloud data to the doctors. Note that the outsourced medical data may contain sensitive and private information (e.g., medical case and diagnostic report). It is often necessary to encrypt the medical data before it is uploaded to the cloud. However, the encrypted data cannot provide good usability due to the difficulty of searching over encrypted data. To address this issue, Searchable Symmetric Encryption (SSE) technology has been proposed in the literature as a fundamental approach to enabling keyword search over encrypted cloud data [8]. The existing searchable encryption schemes can achieve fuzzy keyword search, ranked

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**Abstract:** In medical cloud computing, a patient can remotely outsource her medical data to the cloud server. In this case, only authorized doctors are allowed to access the data since the medical data is highly sensitive. Encrypting the data before outsourcing is a commonly used approach, where the patient only needs to send the corresponding encryption key to the authorized doctors. This, however, significantly limits the usability of outsourced medical data due to the difficulty of searching over the encrypted data. In this paper, we propose two Secure and Efficient Dynamic Searchable Symmetric Encryption (SEDSSE) schemes over medical cloud data. Firstly, we leverage the secure k-Nearest Neighbor (kNN) and Attribute-Based Encryption (ABE) techniques to propose a dynamic searchable symmetric encryption scheme, which can achieve two important security features, i.e., forward privacy and backward privacy which are very challenging in the area of dynamic searchable symmetric encryption. Then, we propose an enhanced scheme to solve the key sharing problem which widely exists in the kNN based searchable encryption scheme. Compared with existing proposals, our schemes are better in terms of storage, search and updating complexity. Extensive experiments demonstrate the efficiency of our schemes on storage overhead, index building, trapdoor generating and query. **Keywords:** Artificial intelligence, deep learning, E-government, web services.

### I. INTRODUCTION

Health care service has been extensively studied to improve medical quality and reduce the cost of medical services [1], [2]. With a large amount of medical data, a health care system must extend its scale to provide efficient and secure services [3]. Media cloud computing, which treats computing as a utility, leases out the computing and storage capacities to the public patients and doctors. It is a revolutionary computing paradigm which enables dynamic resource allocation, selfdemand services, measurement of service, transparency of resource, etc [4]. As such, a patient can remotely store her data on the cloud server, namely data outsourcing, and then open her cloud data to the doctors. Note that the outsourced medical data may contain sensitive and private information (e.g., medical case and diagnostic report). It is often necessary to encrypt the medical data before it is uploaded to the cloud. However, the encrypted data cannot provide good usability due to the difficulty of searching over encrypted data. To address this issue, Searchable Symmetric Encryption (SSE) technology has been proposed in the literature as a fundamental approach to enabling keyword search over encrypted cloud data [8]. The existing searchable encryption schemes can achieve fuzzy keyword search, ranked

## Dynamic Searchable Symmetric Encryption over Medical Cloud Data: Secure and Efficient Achievement

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**A COMPARATIVE STUDY OF CUSTOMERS' SATISFACTION TOWARDS  
HOUSING FINANCE OFFERED BY HDFC AND LIC**

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**ABSTARCT:**

Since the beginning of civilization, the home has served as a focal point and domestic tool for the moral and intellectual development of humans. One of the most essential things that humans require is housing. A decent place to live is necessary for human survival. The situation is worse in poorer nations. In India, the housing situation has gotten worse recently. India has launched numerous housing reforms that have taken on various shapes and expressions and are defined by decreased social allocation, less public spending, and increased emphasis on the real estate industry in close collaboration with private actors. Our research has sought to compare the comparative study of customer satisfaction towards housing finance offered by Housing Development Finance Corporation Limited (HDFC) and Life Insurance Corporation (LIC). The paper also studied customers' satisfaction and issues they encountered when applying for a home loan. A sample size of 200 respondents was obtained by random sampling for the research approach. We have gathered both primary and secondary data for the study. To arrive at a precise outcome, the entire study process was finally carried out in a systematic manner. The goals served as the foundation for the entire study and its conclusions.

**KEYWORDS:** Home Loans, Types, Procedure, Comparison, Customer Satisfaction

**INTRODUCTION**

An important long-term commitment is a mortgage. The need for mortgage loans has risen during the past ten years. The change in thinking brought about by globalisation and integration with Western economies, where mortgages rule the roost, income tax breaks in the Union Budgets, and a significant increase in the ability of Indian youth to generate income are the obvious causes of this expansion. As a result, the current state of home loans indicates healthy growth and a promising future. Many banks and housing finance organisations provide affordable home loans with low interest rates. Both the institutions are highly competitive housing financing. For home loans, most consumers get finances from public sector banks, particularly because they think the banks are more secure and the interest rates are lower. On the other hand, private sector banks are moving into our nation on a regular basis, and as a result of the services and facilities they offer, the younger population's preferences are changing. The consumer should be aware of every phrase associated with home loans before applying for a loan, and that is the most crucial item. In order to suit client needs, public and private sector banks offer a variety of home loans, including home purchase loans, home improvement loans, home construction loans, home extension loans, home conversion loans, land purchase loans, bridge loans, and mortgage loans.

Mortgages, another name for home loans, are secured by the borrower's residence. This residence may be a single-family home, a multi-family building with up to four units, a condominium, or a cooperative unit. Home loans are funded by lenders, but they are originated or processed by lenders as well as brokers working on their behalf. In the late 1800s, during the country's economic growth, home loans became very popular. Lenders started offering loans for the gap between the buying price of a home and the cash down payment provided by the buyer because the average individual typically cannot afford to pay cash for something as expensive as a home. The transition to the contemporary amortised mortgage, which divides payments into both principle and interest sections, was necessitated by the Great Depression and the ensuing foreclosures. The residence is paid off by the conclusion of the 15- to 30-year loan term.

## AN INVESTIGATIONAL STUDY ON USAGE OF WASTE PLASTIC, QUARRY DUST, AND SANDS IN THE PRODUCTION OF BRICKS

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College Of Engineering And Research, Hyderabad.

### ABSTRACT

Plastic waste is a non-biodegradable waste that cannot disintegrate which results in contamination of the air, water, and land. Additionally, the proportion of plastic waste is steadily rising as we burn it in the dump. As we use hundreds of different plastic grades in our daily lives, it is predicted that the amount of plastic garbage would quadruple after ten years. The discarded plastic is recyclable and reusable. This calls for new innovation on our part as civil engineers, which is advantageous for the field. Therefore, we are attempting to create some novel bricks or tiles using plastic sand. Basically, we used earth-based clay to make bricks and tiles. It demonstrates the effects of resource exhaustion and environmental deterioration since clay is used excessively. In plastic waste we consider Drinking Water Bottles (polyethylene terephthalate), Carry Bags, Bottles Caps, house hold Articles (High Density Polyethylene), Milk Pouches, Sacks, Carry Bags, Bin Linings, Cosmetics and Detergent Bottles (Low Density Polyethylene), Bottle Caps and Closures, Wrappers of Detergents, Biscuit (Poly Propylene), Electricals Fittings, Handles and Knobs (Urea Formaldehyde), Casting, Bonding Fibers (Polyester resin) etc. In this, we get to crush the plastic waste into fine particles and heated on a furnace (Bhatti). We use stone dust as fine aggregates (size below than 4.75mm), heated on a furnace (Bhatti). Now, we mix heated plastic waste and heated stone dust and pour into mould and form bricks and tiles. We observed that the characteristics of bricks and tiles is far much better than normal bricks and tiles as minimum water absorption, highly compressive strength, smooth surface, unbreakable, less weight etc.

**Keywords:** Quarry dust, waste plastic, non-biodegradable, Carry Bags, Bottles Caps, compressive strength, water absorption

### 1. INTRODUCTION

Municipal Solid Waste (MSW) contains an increasing amount of plastic waste. Every ten years, the rate of utilization is thought to double. Consumption of plastic is high, and polyethylene is one of the most common types of plastic trash (PE). These used plastics are efficiently used in this project to lessen the amount of land needed to discard them. As a result, several hazardous diseases can be prevented. Bricks, concrete blocks, tiles, and other common building materials are utilized in construction. However, these materials are pricey, making it impossible for regular people to easily buy them. Additionally, these building materials need certain compositions in order to have the appropriate qualities. One of the more modern engineering materials to be used is plastic in the market all over the world. It is a material consisting of a wide range of synthetic or semi-synthetic organic compounds that are malleable and can be molded into solid objects. By definition, plastics can be made to different shapes when they are heated. It exists in the different forms such as cups, furniture, basins, plastic bags, food and drinking containers and they become waste material. Accumulation of such wastes can result into hazardous effects to both human and plant life. Therefore, need for proper disposal, and if possible, use of these wastes in their recycled forms arises.

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## AN ANALYTICAL STUDY ON BLACK COTTON SOIL'S STRENGTH BEHAVIOR DURING TREATMENT WITH BAMBOO FIBER AND SILICA FUME

<sup>1</sup>B.VISHNU VARDHAN REDDY, <sup>2</sup>N.GANGARAM, <sup>3</sup>E.MOHAN, <sup>4</sup>P.LIZZY  
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### ABSTARCT

The rapid growth of urbanisation and industrialization has made it crucial to reduce commercial trash today. Finding this creative and unconventional study on waste usage is becoming more important these days. From an environmental point of view, the use of waste materials like slag, rice husk ash, silica fume, etc. in geotechnical engineering has been encouraged. The compaction and strength behaviour of silica fume-treated black cotton soil (BC soil) reinforced with bamboo fibres is discussed in this project. To determine the ideal level of silica fume, different percentages of silica fume, including 5%, 10%, 15%, and 20%, were used. BAMBOO FIBER has been randomly included into the silica fume treated soil at four different percentages of BAMBOO FIBER content, i.e., 0.5%, 1% 1.5%, and 2% (by weight of soil). The tests which were carried out are water content, atterberg limits, different free swell, grain size analysis, specific gravity, unconfined compression test, proctor compaction test and California bearing ration.

For the experimental to study then it observed that 1% of Bamboo fibres test individually along with the combination of Silica fume with black cotton soil to the improvement of their durability and strengths of the soil. The test result indicates that strength properties of optimum combination of BC soil SILICA FUME specimens reinforced with bamboo fibres is appreciably better than untreated BC soil. And also, the strength of the mixed soil increases with increase in days. The above test results and the results were analysed for the suitability of subgrade under certain loads in laboratory conditions.

Finally, laboratory testing reports to compare the treated and untreated black cotton soil to improve their soil properties to increase their strength, durability and improve their stiffness of the soil particles at any particular season regions.

**Keywords:** Bamboo Fiber, Silica Fume, Standard Proctor Test, California Bearing Ratio.

### 1. INTRODUCTION

Since there have been buildings, many ancient societies have recognized the need to develop the soil's engineering features. For example, the Chinese and Romans used a variety of methods to increase the stability of the soil. The soil may be an unconsolidated material made up of natural aggregates of mineral grains that have formed as a result of rock dissolution. The composition and deposition of soil by transportation agents determine its physical and chemical qualities.

When suitable ground condition are not encountered at shallow depth and to improve the performance o barrow soil a geotechnical engineer opinion and for the modification of the Soil is a big question so in order to overcome these we are using or developing various methods off stabilization of soil for future construction. Black cotton soil is problematic in nature because it exhibits significant swelling and shrinkage behaving depends upon the moisture content which present in the soil particles the clay particles (sticky) present various problems at time of construction in order to rectify these problems of stabilization of BC soil by using these bamboo fibre content and silica fume.

### 2. BLACK COTTON SOIL

These soils are high in (a)lime (b)iron (c) magnesia and (d)alumina are lack in phosphors and nitrogen and organic matter and of its high shrinkage and swelling characteristics these BC soils by these both conditions it may causing the problems like swelling of structure , uplift pressures and produces high in the foundation,



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## ANALYSIS OF EFFECTIVE EARTHQUAKE PROTECTION MEASURES FOR RC BUILDINGS ON SLOPING TERRAIN

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### ABSTRACT

Shear wall systems are one of the most widely used lateral load resisting systems in high-rise structures. Shear walls have extremely high in plane stiffness and strength, which can be used to resist significant horizontal loads while also supporting gravity loads, making them quite useful in many structural engineering applications. To design and study the shear wall, there is a wealth of information accessible. However, there isn't much discussion in any literature regarding where the shear wall should be placed in multistory buildings.

In this Analysis, therefore, main focus is to determine the solution for shear wall location in multi storey building. The shear walls will be introduced in the framed structure at suitable locations and the analysis is made for both for static and dynamic loads caused due to earthquakes. A RCC building of 6 storey placed subjected to earthquake loading in zone-II is considered. An earthquake load is calculated by seismic coefficient method using IS 1893(PART-I):2002. These analyses were performed using STAAD Pro. A study has been carried out to determine the strength of RC shear wall of a multistoried building by changing shear wall location. The proposed six storey building is first analyzed without shear walls. The three different cases of shear wall position for a 6 storey building have been analyzed later. The results of the above four analysis will be compared and optimize the shear wall frame structure i.e. (shear walls and frames) will be suggested for the building considered for the analysis. This analysis will help in achieving safety against earthquakes as well as keeping the flexibility of the frame structure intact. It is concluded that incorporation of shear wall has become inevitable in multistory buildings to resist lateral forces. The type II shear wall proposed in this analysis proves to be more efficient and will achieve maximum safety towards earthquakes in zone-II

**Key words:** Multi-storey, RC structure, seismic analysis, RC shear wall, STADD Pro.

### 1. INTRODUCTION

India is one of the nations that are most vulnerable to earthquakes with a magnitude greater than 6. More than 60% of the land is vulnerable to earthquakes with an intensity of 7 or higher. In fact, it is thought that the entire Himalayan region is susceptible to earthquakes of a magnitude larger than 8.0. Four such large earthquakes of this magnitude have struck in the past 50 years, in the years 1897 Assam (M 8.7), 1905 Kangra (M 8.6), 1934 Bihar-Nepal (M 8.4), and 1950 Assam-Tibet (M 8.4). [22] Greater earthquakes occur in India rather frequently, while mild earthquakes occur less frequently. In some parts of the world, such as the northeastern portion of India, hilly regions are more susceptible to seismic activity. Traditional building materials that are readily available in mountainous areas, such as adobe, red brick, and stone masonry and dressed stone masonry, timber reinforced concrete, bamboo, etc., is used for the construction of houses. The

## ANALYSIS OF EFFECTIVE EARTHQUAKE PROTECTION MEASURES FOR RC BUILDINGS ON SLOPING TERRAIN

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College Of Engineering And Research, Hyderabad.

### ABSTRACT

Shear wall systems are one of the most widely used lateral load resisting systems in high-rise structures. Shear walls have extremely high in plane stiffness and strength, which can be used to resist significant horizontal loads while also supporting gravity loads, making them quite useful in many structural engineering applications. To design and study the shear wall, there is a wealth of information accessible. However, there isn't much discussion in any literature regarding where the shear wall should be placed in multistorey buildings.

In this Analysis, therefore, main focus is to determine the solution for shear wall location in multi storey building. The shear walls will be introduced in the framed structure at suitable locations and the analysis is made for both for static and dynamic loads caused due to earthquakes. A RCC building of 6 storey placed subjected to earthquake loading in zone-II is considered. An earthquake load is calculated by seismic coefficient method using IS 1893(PART-I):2002. These analyses were performed using STAAD Pro. A study has been carried out to determine the strength of RC shear wall of a multistoried building by changing shear wall location. The proposed six storey building is first analyzed without shear walls. The three different cases of shear wall position for a 6 storey building have been analyzed later. The results of the above four analysis will be compared and optimize the shear wall frame structure i.e. (shear walls and frames) will be suggested for the building considered for the analysis. This analysis will help in achieving safety against earthquakes as well as keeping the flexibility of the frame structure intact. It is concluded that incorporation of shear wall has become inevitable in multistorey buildings to resist lateral forces. The type II shear wall proposed in this analysis proves to be more efficient and will achieve maximum safety towards earthquakes in zone-II

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## INVESTIGATIONAL EVALUATION OF CONCRETE PERFORMANCE USING WASTEPAPER SLUDGE ASH AS PARTIAL REPLACEMENT OF CEMENT

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### ABSTRACT

The use of discarded objects rather than infinite resources is arguably the greatest strategy for making the solid area serious. The plant slime is a significant economic and environmental problem for the paper and board sector. The production of waste paper is enormous all around the world. Paper garbage makes for 0.7% of the total delivered municipal rubbish in India. The material is a byproduct of deinking and repulsing paper. The most effective methods of recycling and disposal for paper waste include utilizing it as rural manure, burning it in paper mill CHP plants, managing paper cinders, and disposal in landfills. The Code of Conduct of the Industry restricts and guarantees the extension of waste removal locations. In useful words, paper slop comprises of cellulose strands, fillers, for example, calcium carbonate and china mud, and remaining water-bound synthetic compounds. Generally, the dampness content is up to 40%. The substance is thick, tacky and difficult to dry and can contrast in thickness and knottiness. It has an energy content that makes it an important possibility for the improvement of Portland concrete as an elective fuel. Paper slop is as of now being utilized as an elective fuel It is reviewed as Category 2 (fluid elective fills) in the Cembureau class of elective powers. After burning of paper slop at roughly 800 0C, the subsequent fly debris can contain receptive silica and alumina (metakaolin) just as lime (CaO) that contribute artificially to Portland concrete fixings. Concrete handling area is one of the carbon dioxides discharging sources close by deforestation and ignition of petroleum products and the solid business is one of the primary clients of virgin regular materials. The worldwide concrete industry contributes around 7% of ozone depleting substance discharges to the Earth's environment. To counter the ecological effect of concrete production and the ceaseless loss of common capital, it is essential to make substitute folios to make the solid business reasonable. This proposal investigates the practicality of utilizing wastepaper ooze as an incomplete replacement of concrete for new concrete. In this examination, wastepaper slop debris was mostly enhanced by 5%, 10%, 15% and 20 percent of concrete in cement for the M-20 blend and tried for its compressive strength, elasticity, water ingestion and evaporate thickness to 28 days old enough comparative with standard cement. In light of the discoveries got, the wastepaper slime debris ought to be utilized as a concrete substitute by up to 10% by weight and a molecule size of under 90µm to keep away from a drop in functionality. Numerous wastepaper slimes has an extremely high calorific worth and ought to be utilized as a fuel prior to utilizing the debris as an incomplete concrete substitute.

Keywords: Wastepaper slop debris, Compressive strength, Elasticity, Water ingestion, Evaporate thickness



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## ANALYSIS ON AFFECT OF DOLOMITE POWDER AND COPPER SLAG ALONG WITH ITS MECHANICAL PROPERTIES OF M30 GRAD

<sup>1</sup>P.MANIRATNAM, <sup>2</sup>PAVAN YADAV, <sup>3</sup>MUNAVAR MIRZA, <sup>4</sup>J.ESHWAR

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### ABSTRACT

One of the most crucial components of concrete is cement. Numerous concrete qualities depend on the cement. High-temperature calcinations of argillaceous and calcareous materials produce cement. During this process, a sizable amount of CO<sub>2</sub> is released into the atmosphere. India is the world's second-largest producer of cement. One tone of cement produced is anticipated to produce 0.8 tones of CO<sub>2</sub> emissions. In addition to lowering the price of concrete, reducing cement consumption would also result in less CO<sub>2</sub> emissions. Common river sand is an expensive natural resource for transporting. Additionally, the widespread destruction of natural resources has an impact on the ecosystem. As environmental transport and other restrictions make the supply and use of river sand less desirable, a substitute or replacement commodity for the concrete industry needs to be identified. The most widely used fine aggregate in the manufacture of concrete is the issue of extreme scarcity in many regions. In such a case, dolomite powder and copper slag can be an inexpensive substitute for the partial substitution of cement and sand. Coming to the dolomite powder obtained by powdering the sedimentary rock-forming mineral dolostone. It has some of the same features as cement. Coming to the copper slag formed by the by-product of copper extraction by smelting. This research presents the feasibility of using dolomite powder and copper slag as a partial substitute. Mix concept has been developed for grade M30 using the IS design approach for both standard and dolomite powder, copper slag mixed concrete. Tests were performed on cubes and beams to research the strength of concrete made of dolomite cement, copper slag concrete, and the findings were compared to natural sand concrete. The findings demonstrate that the strength parameters are higher than in dolomite powder, copper slag concrete relative to natural concrete in standard conditions.

**Keywords:** Dolo stone, Calculating, Copper slag, Dolomite powder.

### I INTRODUCTION

In a research [1] for M20 concrete, the partial replacement of copper slag and dolomite enhanced the compressive strength and flexural strength with copper slag replacement being made constant at around 20% and with variable dolomite replacements from 20% to 30% at regular intervals of 5%. Some researchers observed that [2] for an M25 grade concrete, the compressive strength increased with substitutions ranging from 10% to 30% of dolomite and 25% of copper slag. The use of dolomite powder lowers the price of concrete [3] while increasing its strength. This study investigated the potential use of dolomite as a cement substitute. The



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## ANALYSIS ON AFFECT OF PARTIALLY REPLACING SAND WITH QUARTZ ON CONCRETE'S STRENGTH CHARACTERISTICS

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The strengthening of existing structural components using easily accessible materials on the market is one of the main difficulties and areas of current study in the field of structural engineering. Numerous studies have been done on strengthening different structural components utilizing both conventional and cutting-edge materials. Many scientists have experimented with utilizing quartz powder to increase strength. Because of this, employing Quartz Powder Concrete composites results in a higher weight to strength ratio and compatibility in terms of strength. Making concrete resistant to weathering author is a cost-effective method that uses quartz powder in place of sand. The proposed a method for designing concrete mixes that substitutes quartz for some of the sand. In the present work, the mechanical properties were evaluated by the workability property was assessed by conducting slump cone test for conventional concrete for the mixes procedure in which sand is replaced with 0%, 5%, 10% and 15% of quartz powder. The research also revealed that there is possibility of replacing fine aggregate with quartz sand in the production of structural concrete. The mix proportion adopted was 1:1.5:2.66 as per IS 10262:2019. Compressive and flexural strength tests were carried out to evaluate the strength properties of concrete at the age of 7 and 28 days. Modulus of elasticity tests were carried out at the age of 28 days.

**Keywords:** Quartz powder, Slump Cone Test, Compressive strength, Flexural strength.

### INTRODUCTION

One of the major contributors to the release of carbon dioxide (CO<sub>2</sub>) globally is the building sector. Due to CO<sub>2</sub> emissions, the production of cement and the energy needed for building present significant issues. The manufacturing of one tonne of Portland cement is thought to result in the emission of around one tonne of CO<sub>2</sub> into the atmosphere. Therefore, in order to save energy and lessen pollution, additives that are less expensive than regular Portland cement (OPC) are employed in cement-based products. Despite extensive research and study into the viability of using fly ash, volcanic ash, and steel slag as cement substitutes, many parts of the world face issues with a consistent supply of cement supplementary cementations materials. Accordingly, in order to reduce the cement content in concrete and develop new



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### I INTRODUCTION

One of the major contributors to the release of carbon dioxide (CO<sub>2</sub>) globally is the building sector. Due to CO<sub>2</sub> emissions, the production of cement and the energy needed for building present significant issues. The manufacturing of one tonne of Portland cement is thought to result in the emission of around one tonne of CO<sub>2</sub> into the atmosphere. Therefore, in order to save energy and lessen pollution, additives that are less expensive than regular Portland cement (OPC) are employed in cement-based products. Despite extensive research and study into the viability of using fly ash, volcanic ash, and steel slag as cement substitutes, many parts of the world face issues with a consistent supply of cement supplementary cementations materials. Accordingly, in order to reduce the cement content in concrete and develop new

## A TRANSFORMER-LESS ULTRA HIGH-GAIN DC-DC CONVERTER FOR DC MICROGRID APPLICATION

**Dr. Narendra Kumar M**, Principal and Professor in Electrical and Electronics Engineering Department. Kasireddy Narayanreddy college of engineering and Research, Hyderabad.

### ABSTRACT

This project proposes and analyses a transformer less ultra-high gain dc-dc converter. When compared to the boost converter, the converter has a gain of six times. Switched capacitors and switched inductors are used to boost the gain. A voltage multiplier cell with switching inductors is presented as a modification. The converter is operated by a single switch, making it simple to use. The converter's steady-state performance is examined in depth. The converter provides high gain at low duty ratios and has good open loop performance. In MATLAB Simulink, the suggested converter's functionality is confirmed and validated.

**Keyword:** DC-DC converter, Duty ratio, Transformer less

### 1. INTRODUCTION

Power electronics are critical for extracting the maximum amount of energy from renewable and sustainable energy sources. A DC microgrid is seen schematically in Figure 1. High gain dc-dc converters operate as a bridge between the load and the source, boosting low voltage (12V-60V) generated by batteries, solar PV, and fuel cells to high DC voltage (200-300V). Furthermore, in a DC microgrid, a high gain dc-dc converter keeps the dc-link voltage at the necessary level [1]. Because supercapacitors have a high power density but a low voltage rating, a DC microgrid today uses a combination of supercapacitors and a high gain dc-dc converter. In today's level three fast charging of electric vehicles, high gain converters are used (EV). In islanded mode functioning of a DC microgrid, a combination of a high gain converter and an inverter can be employed to feed AC loads. To obtain the high gain, these are related with low efficiency and high duty cycle operation. There is also a difficulty with reverse recovery in the diode when the duty cycle is increased. Isolated and non-isolated structures are the two basic types of converters. Isolated converters divide the output from the input circuit electrically into two separate portions, prohibiting direct current flow. The use of a high-frequency transformer achieves this, although it increases the size and expense of the converter [3],[6]. In high-power applications and where a common ground between the source and the load is necessary, isolated topologies are used.

Where input and output isolation is not necessary, non-isolated converters are preferred. They are divided into two types: paired and non-coupled [7]. Coupled inductor topologies can give very high voltage gain with little stress on the semiconductor switch, however leakage inductance issues can cause huge voltage spikes across the switch, necessitating the use of a clamped circuit. The cascading of two or more converters is used to generate a high gain capacitor-diode voltage multiplier cell. To boost the gain of the converter, some new and updated topologies use a voltage multiplier circuit (VMC) made out of switching capacitors and inductors. At low duty cycles, the quadratic boost (QBC) and cubic boost topologies can yield significant gain with less stress on switching devices [8]-[10], but at larger duty ratios, efficiency may decline as current increases. Furthermore, at greater duty cycles, the inductor core is more prone to saturation. [11] proposes a novel quadratic boost converter with decreased inductor current ripple and minimal switch stress. Power supplies for modern electronic devices must be of high quality, compact, reliable, and efficient. Linear regulators are capable of producing very high-quality output voltages. Their major application is as low-drop-out voltage regulators at low power levels. The active (linear) mode is used by electronic devices in

## SINGLE DC-SOURCE-BASED SEVEN-LEVEL BOOST-INVERTER FOR ELECTRIC VEHICLE APPLICATIONS

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Kasireddy Narayanreddy college of engineering and Research, Hyderabad.

### ABSTRACT

This research presents a circuit layout for a multilevel inverter that can enhance the number of output voltage levels while using fewer devices. This study proposes a single dc-source-based seven-level inverter (LI) with boosting capacity. To provide seven-level boosted output, the suggested inverter uses eight switches, two diodes, two capacitors, one inductor, and a single dc source. The suggested inverter is suited for electric vehicles because it uses a single dc supply and has boosting capabilities, requiring less series-connected battery cells. The proposed 7LI uses phase-shifted pulse-width modulation (PWM), a multi-carrier-based PWM technology, to generate switching pulses. A device count-based comparison of the proposed inverter to recent topologies is carried out. Simulation is used to assess the viability and impact of the proposed inverter, which is then validated with a laboratory prototype.

**Keywords:** Boost inverter, electric Vehicle, PWM

### 1. INTRODUCTION

The electric motor is driven by an inverter, which is built to the exact specifications of the EV traction drive. In the case of bigger EVs like buses and trucks, where modular inverter design is more practical, a high-power inverter is required. The traditional two-level voltage-source inverter (VSI) for drive has two major drawbacks: (i) In electric vehicles, the development of high-frequency ripple current at the dc bus, which increases as the ambient temperature rises. As a result, a larger capacitor is required, lowering the EV's power density and efficiency. (ii) In order to commutate large motor currents, VSI is run at a higher switching frequency, which results in substantial switching losses. Multilevel inverters (MLIs) have less filter requirements, lower electromagnetic interference, lower switching losses, and less stress on switches than two-level inverters (LIs). To overcome the limits of the 2LI and to take into account the needs of electric vehicles, the MLI is a better power converter.

In order to increase the number of output levels while reducing the number of devices, the number of voltage sources must also rise. Several MLI topologies using a single dc source are presented in to address this issue. proposes a 7LI with seven switches, two diodes, and three capacitors that operates with a single dc supply. proposes a 5LI based on packed U-cells. Six switches, one capacitor, and a dc source make up this circuit.

For a seven-level operation, MLI in requires a series-parallel connection of three capacitors and one dc voltage source. Sun et al. present 7LI, a single dc-source based on switching capacitors. proposes a switched-capacitor-based 9LI for high-frequency applications. Because the availability of dc sources in the form of batteries is restricted, these topologies are appealing for EV applications. However, because these battery sources have low voltage ratings, an additional boosting stage following the battery stage will increase EV performance.

MLIs with voltage boosting capability have recently been presented. The boosting stage will minimize the number of batteries required even more. As a result, for an EV application, a single dc-source-operated MLI with boosting capacity is an appropriate solution. Lee et al. present a series of boost switched capacitors for floating capacitors based on 7LIs with self-voltage balancing. presents a switched-capacitor-based 9LI with a maximum boosting capability of twice the input dc source. For photovoltaic applications, Vahedi et al. suggest a modified packed U-cell 7LI. proposes a step-up MLI with fewer switches, however the number of diodes used is large. All of the boost MLIs shown in need a large number of components. The number of



## HIGH-STEP-UP DC-DC CONVERTERS FOR PHOTOVOLTAIC APPLICATIONS USING Z-SOURCE

<sup>1</sup>V.H.Sowjanya, <sup>2</sup>A.Munil Reddy, <sup>3</sup>D.Amarnath, <sup>4</sup>Sanjay Yadav

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### ABSTRACT

By combining a typical ZS network with switched-capacitor (SC) cells, this research presents three high-step-up Z-source (ZS)-based DC-DC converters. The suggested converters have a straightforward design with a smooth input current, a high voltage gain, and low voltage stress on semiconductor components. Furthermore, unlike certain current ZS-based topologies in the literature, the suggested converters do not limit the duty cycle of the power switch. These features make the suggested converters ideal candidates for connecting a low-voltage solar PV panel to a high-voltage DC bus in PV applications. The operating principles and steady-state analyses of the three converters proposed are described in depth for the one with the most components. Two other proposed converters' steady-state voltage and current relationships are, however, tabulated. Aspects of design are also discussed. In terms of component count, normalized voltage stress on the power switch and diodes, and voltage gain, the proposed converters are compared to similar existing high step-up DC-DC converters. Finally, experimental results utilizing a 400 W/400 V laboratory prototype validate the theoretical analysis and computation.

### 1. INTRODUCTION

Over the last ten years, the use of solar panels has exploded. The traditional technique for increasing the voltage level of PV generating is to connect the PV panels in series. Due to partial shadowing and module mismatches, however, the PV panels' output power is considerably reduced. To produce high step-up converters, the Z-source (ZS) and quasi-Z-source (qZS) networks have recently been combined with several voltage-boosting approaches. As a result, boosting through ZS and qZS networks has been extended to DC-DC converters. The voltage stresses across the devices were significant, and the duty cycle range was limited to percent, as was the case in [28]. [30] employed a hybrid SCSL approach to make a qZS high-voltage gain converter with a large number of passive components. A high-voltage gain converter was presented in [31] by combining two SL cells with the qZS network; however, the number of passive components and voltage stress across the devices were considerable, and the duty cycle range was limited to 23.6 percent. The SC approach is integrated into the traditional ZS network in this paper, and a new SC-based ZS (SCZS) network is proposed as a result. The proposed SCZS network can have a symmetrical or asymmetrical structure, with two alternative configurations for the asymmetrical structure. In addition, unlike traditional ZS converters, the output diode and output capacitor are connected to the SCZS network in a different method. As a result of the process, three novel SCZS DC-DC converters have been developed. The proposed topologies are unlike any other ZS-based high step-up DC-DC converters currently on the market. The suggested converters greatly boost the voltage gain and lower the voltage strains on semiconductor devices when compared to traditional ZS converters. Furthermore, all capacitors in the ZS network and SC cells are subjected to the same and low voltage stresses. Furthermore, the suggested converters do not have any duty cycle constraints.

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## HYBRID HIGH VOLTAGE GAIN DC-DC CONVERTER USING BOOST CONVERTERS AND PHOTOVOLTAIC SYSTEMS

<sup>1</sup>P.Kiran, <sup>2</sup>K.Govind Rao, <sup>3</sup>D.Ravi Kumar, <sup>4</sup>G.Naveen

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**Keyword:-**Boost converter, switched capacitor, voltage multiplier, high voltage gain.

### INTRODUCTION

The converter used in this designed article is Boost converter to increase the voltage gain. Gain at a high voltage DC-DC converters are utilized in photovoltaic systems, electric automobiles, and DC micro grids, among other applications. Two types of DC-DC converters can be employed in these applications. Isolated and non-isolated DC-DC converters are two types of DC-DC converters. The turn's ratio of the coupled inductor or transformer is adjusted in isolated converters to get a high voltage gain. However, by doing so, the component's leakage inductance increases, resulting in large switching losses and voltage spikes, compromising the converter's efficiency. If a dc-ac inverter connects the dc-dc stage to grid tie, the transformer assures that there are no ground fault currents or leakage currents. The parasitic capacitor between the PV panel and ground is to blame. As a result, non-isolated dc-dc converters are used to obtain good performance. The convention dc-dc Boost converter is unique among non-isolated converters. Adjusting the duty cycle(D) of the converter is the best way to get high voltage gain. Due to the converter's inherent resistance, however, such a goal is impossible to achieve. In practice, this is impossible to achieve to get around this issue [10] and [11] presented transformerless dc-dc converters. Inductor values are high, because L1&L2 are not the same, resonant voltage develops. Unbalanced voltage stress is caused by two switches (s1&s2). As a result, voltage stress across the switches is unbalanced [12]. A remedy to this problem, in addition to boosting voltage gain, is to increase the number of transistors as proposed in [9], [13], [14], [15]-[17]. This strategy is effective the number of gate drive circuits is increased, the control complexity, costs, and power density, as well as the a variety of power sources. This auxiliary switch also has stress caused by high voltage. For these reasons, it is evident that one must seek out without increasing the number of solutions with a significant voltage gain a set of switches. In was reported in [2] and [10] that voltage resonance across the switches induced by mismatched inductors (L1&L2) values might be implemented without impairing the converter's performance. Furthermore, the switched capacitor. In [2] the switched inductor cell was employed, while in [10], the switched inductor cell was introduced to the converter. These strategies boost the converter's static gain, but a high duty cycle is still req. to be put to use this raises the converters conduction losses. Consequently efficiency is harmed. This article proposes a unique high step-up dc-dc converter based on advantages and shortcomings of transformless dc-dc. The proposed converter combines two converter shown in fig.1 a switched capacitor cell with a voltage multiplier cell. This as a result, the converter achieves excellent efficiency while operating at low voltage and existing

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## HYBRID POWER GENERATION AUTOMATION AND PREDICTION USING STANDALONE HYBRID SOLAR P-V WIND ENERGY SYSTEM

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### ABSTRACT

This study proposes to combine p-v solar and wind sources into one and to enhance the functionality of the current power grid such that, even if one source is not operational for whatever reason, the grid may still function thanks to the other source. All traditional energy sources are currently becoming more and more scarce. Without damaging the environment, this activity stimulates the sustainable energy ex-chequer. Future conventional electricity generation will be a challenging task. In order to harness the power from the suggested hybrid energy system in an efficient and reliable manner, a solar photovoltaic system, a wind energy system, and a battery bank are integrated via a common dc link architecture. Individual components such as batteries, IGBTs, inverters, solar panels, and batteries are used in hybrid energy system are deliberated in the modelling process. We suggest that a standalone hybrid solar p-v wind energy system for applications in remote area.

**Keywords:** photovoltaic, inverter, wind system, ex-chequer, hybrid energy system

### 1. INTRODUCTION

Numerous efforts have been made to create effective renewable energy conversion systems as a result of the recent focus on renewable energy sources. The main objectives of these strategies are to reduce environmental harm, conserve energy, utilize non-renewable resources, and increase safety. Power can be supplied by renewable energy systems to a utility grid or an isolated load. In isolated, off-grid locations, the independent system's applications are more varied.

To address the world's expanding energy needs, research into alternative energy sources has become necessary due to the quick depletion of fossil resources. Another crucial objective for lowering our reliance on non-renewable energy sources is combating global warming. AS a result, alternative energy sources must be discovered in order to meet the ever-increasing energy demand while limiting the negative environmental effects of the same. Due to their ease of availability and topological advantages for local power generation in remote places, solar photovoltaic and wind energy recognized as a capable power generating sources. Due to easy of availability and economic effectiveness, solar PV and wind energy have increased in popularity since the 1970s oil crisis.

The most promising renewable energy technologies are photovoltaic and wind energy systems. A PV array, DC-DC converter, DC-AC inverter, load make up a photovoltaic (PV) system. The creation of appropriate algorithms to manage the power converter is critical for the PV system's efficient operation. Wind power is another cost-effective renewable energy source, and in industrialized nations with abundant wind resources, on shore wind often outperforms fossil fuel output. This gives less losses and more efficient energy for remote areas. Most of the places they prefer this hybrid system.

The use of wind power has increased dramatically in recent years. Enormous expansion in the last ten years, and has been; acknowledged as a cost-effective and environmentally sustainable option electric power generation that is competitive. The wind is blowing. The energy system creates power in the form of

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This study proposes to combine p-v solar and wind sources into one and to enhance the functionality of the current power grid such that, even if one source is not operational for whatever reason, the grid may still function thanks to the other source. All traditional energy sources are currently becoming more and more scarce. Without damaging the environment, this activity stimulates the sustainable energy ex-chequer. Future conventional electricity generation will be a challenging task. In order to harness the power from the suggested hybrid energy system in an efficient and reliable manner, a solar photovoltaic system, a wind energy system, and a battery bank are integrated via a common dc link architecture. Individual components such as batteries, IGBTs, inverters, solar panels, and batteries are used in hybrid energy system are deliberated in the modelling process. We suggest that a standalone hybrid solar p-v wind energy system for applications in remote area.

**Keywords:** photovoltaic, inverter, wind system, ex-chequer, hybrid energy system

### 1. INTRODUCTION

Numerous efforts have been made to create effective renewable energy conversion systems as a result of the recent focus on renewable energy sources. The main objectives of these strategies are to reduce environmental harm, conserve energy, utilize non-renewable resources, and increase safety. Power can be supplied by renewable energy systems to a utility grid or an isolated load. In isolated, off-grid locations, the independent system's applications are more varied.

To address the world's expanding energy needs, research into alternative energy sources has become necessary due to the quick depletion of fossil resources. Another crucial objective for lowering our reliance on non-renewable energy sources is combating global warming. AS a result, alternative energy sources must be discovered in order to meet the ever-increasing energy demand while limiting the negative environmental effects of the same. Due to their ease of availability and topological advantages for local power generation in remote places, solar photovoltaic and wind energy recognized as a capable power generating sources. Due to easy of availability and economic effectiveness, solar PV and wind energy have increased in popularity since the 1970s oil crisis.

The most promising renewable energy technologies are photovoltaic and wind energy systems. A PV array, DC-DC converter, DC-AC inverter, load make up a photovoltaic (PV) system. The creation pf appropriate algorithms to manage the power converter is critical for the PV system's efficient operation. Wind power is another cost-effective renewable energy source, and in industrialized nations with abundant wind resources, on shore wind often outperforms fossil fuel output. This gives less losses and more efficient energy for remote areas. Most of the places they prefer this hybrid system.

The use of wind power has increased dramatically in recent years. Enormous expansion I the last ten years, and has been, acknowledged as a cost-effective and environmentally sustainable option electric poor generation that is competitive. The wind is blowing. The energy system creates power in the form of



## HYBRID POWER GENERATION AUTOMATION AND PREDICTION USING STANDALONE HYBRID SOLAR P-V WIND ENERGY SYSTEM

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## DESIGN AND DEVELOPMENT OF UNIFIED POWER FLOW CONTROLLER USING STATCOM AND VAR COMPENSATORS

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### ABSTRACT

Using MATLAB/SIMULINK, this paper indicates the theory and operation of flexible alternating current transmission system (FACTS) devices, namely the unified power flow controller. Two voltage source converters can be connected back to back through a common DC link capacitor in this paper's UPFC. At the point of connection, the VSC-1, referred to as STATCOM, injects a reactive current into the system. The VSC-2 also called the SSSC, injects voltage into the system in series. The unified power flow controller (UPFC) facilitates real-time control of power flow in transmission lines by adjusting line parameters such as node voltages, phase angle, and line impedance, which cover all other FACTS adjustable parameters. Static synchronous compensator (STATCOM), Static VAR Compensator (SVC), phase shifters, and thyristors are all becoming more common as technology develops.

**Keywords:** Flexible Alternating Current Transmission System (FACTS), Unified Power Flow Controller (UPFC), voltage source converter, Static Synchronous Compensator, Static Synchronous Series Compensator.

### 1. INTRODUCTION

In 1991, Gyugyi invented the concept of the Unified Power Flow Controller (UPFC). The UPFC was designed for real-time control and dynamic compensation of AC transmission systems, and it provides the multifunctional flexibility needed to handle many of the difficulties that the power distribution sector faces. The UPFC may manage all of the characteristics impacting power flow in the transmission line, such as voltage, impedance, and phase angle, concurrently or selectively, within the context of standard power transmission ideas. It can also manage both the reactive and actual power in the line independently.

Turn-on and turn-off capabilities are offered in devices such as GTO, IGBT, MCT, and so on. These devices are more costly and have higher losses than thyristors without the ability to turn off, however, can enable converter concepts that can save money and improve performance. Personality converters, as opposed to line-commutating converters, provide advantages in principle. Line-commutating converters spend reactive power and have commutation failures in the inverter mode of operation when compared to self-commutating converters. The self-commutating converter would be ideal for FACTS controllers. Self-commutating converters are split into two types.

1. current-source converters

2. voltage-source converters

Voltage-sourced converters are frequently favored over current-source converters for FACTS applications due to cost and performance.

Because the direct current in a voltage-sourced converter can flow in either direction, the converter valves must be bidirectional; additionally, because the DC voltage does not reverse, the turn-off devices do not need to be reverse-voltage capable, and these devices are referred to as asymmetric turn-off devices.

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## UTILISATION AND IDENTIFICATION OF DEFECTS IN AN UNDERGROUND CABLE SYSTEM

<sup>1</sup>K.V.Ramamohan, <sup>2</sup>D.Amarnath, <sup>3</sup>K.Swapna, <sup>4</sup>A.Pravallika

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### ABSTRACT

A cable that is buried underground or inside a conduit and afterwards used for communication, power distribution, or any other intended functions is known as an underground cable. Due to their lack of needless hindrance, these cables serve as an alternative to overhead wires. One of the most fundamental practices used in metropolitan areas is the subterranean cable framework. Because the entire line must be dug up to check for cable line faults, it is very difficult to pinpoint the source of a failure. Due to tremor, wear and tear, rats, insulation failure, and other factors, underground cables are vulnerable to a wide range of defects. When an underground cable develops a fault, determining the precise location of the issue for the purpose of repairing that line is extremely difficult. The goal of the research is to detect the location of a fault in underground cable lines in kilometers from the base station. This prototype uses the simple concept of Ohm's law. It is modeled by a set of resistors representing cable length in km and false fault is created by a set of switches at every known distance to cross check the accuracy. In case of faults, the voltage across series resistor changes accordingly, which is then fed to an ADC to develop precise digital data to a programmed Arduino UNO R3. That further displays the fault occurring distance and phase on a 16X2 LCD interfaced with the Arduino UNO R3. We proposed an IOT based model for better detection of fault in the cables. It is used to display the information over the Internet using the Wi-Fi module ESP8266 about the occurrence of fault on the web service-Thing Speak Software. This is providing best result outputs and accuracy compare than other methods. This technique is also providing a very fast speed of operation, which is very necessary for the continuity and stability of power quality. We can use this technique for the detection of faults in underground power lines/cables.

Keywords: Underground Cable fault, Arduino UNO R3 , IOT , LCD, Resistance, Web Page.

### INTRODUCTION

Across the country, a million miles of cables are woven through the air. However, it is now laid underground, which is a greater method than the previous method. Because subterranean cables are not influenced by unfavorable weather conditions such as pollution, heavy rainfall, snow, and storms, underground cables are the best option. However, when a cable problem occurs, it is extremely difficult to pinpoint the specific position of the defect due to a lack of knowledge about the cable's particular location. As the world becomes more digitized, the concept proposes finding the location of a fault in a digital manner; nevertheless, the process of fixing that specific wire is quite complex. A cable fault can occur for a variety of causes. They are: inconsistency, any defect, cable weakness, insulation failure, and conductor



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## ANALYSIS ON THREE-PHASE, THREE-LEVEL T-TYPE CONVERTER DESIGN AND IMPLEMENTATION FOR GRID APPLICATIONS

<sup>1</sup>B.Nagaraju, <sup>2</sup>A.Munil Reddy, <sup>3</sup>V.Deepthi, <sup>4</sup>Shaik Sohail Pasha

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### ABSTRACT

To ensure good power quality, multilevel inverters (MLIs) have emerged as the preferred option for low- and medium-power dc to ac energy conversion applications. In comparison to the traditional two-level inverter, the MLIs have a number of advantages, including a lower dv/dt, less electromagnetic interference, and the ability to handle greater voltage levels with equipment with a lower voltage rating. Due to these qualities, they have become more popular in a range of industrial applications, including, but not limited to, locomotives, mixers, marine propulsion, reactive power compensation, and renewable energy power conversion. The need to produce a significant number of voltage levels while maintaining the highest feasible level of circuit reliability served as the driving force behind this research project. A new topology is therefore developed using the fundamental MLI setups, specifically three phase T Type converter is proposed in this paper.

**Keywords :** T-type converter, high efficiency, three-level converter

### 1. INTRODUCTION

Recently, there has been a lot of interest in energy conversion in the low voltage region. Automotive inverters, PFC rectifiers, and photovoltaic grid inverters are just a few examples of applications. Systems using inverters must be very efficient while being inexpensive. must have passive components that are small and affordable. The switching frequency is frequently raised to a medium level range of 12–25 kHz, which causes higher switching losses and worse efficiency. System effectiveness Acoustic noise might also be a problem. Avoid attempting to decrease acoustic noise. essential in aeroplane applications and high-speed drives. It's typical to use high control and output frequencies up to 1 kHz. A requirement for bandwidth exists. Here, the exchanging is completed. According to earlier studies, multilevel topologies have a high degree of complexity. The efficiency of the converter has a flat relationship with the switching frequency [1], [2]. The assertiveness of the 3-level T-type converter (3LT2C) [3–8] for low-voltage applications is demonstrated in this study. In comparison to the three-level NPC topology, the T-type uses an active bidirectional switch at the dc-link voltage midpoint and uses two less diodes per bridge leg. It's a more straightforward three-level topology than active neutral point clamped converters [9]–

[11] or split-inductor converters [12], [13]. The 3LT2C combines the benefits of two-level converters, such as low conduction losses, small part count, and a straightforward operation concept, with the benefits of three-level converters, such as reduced switching losses and higher output voltage quality. If a two-level voltage source converter is used, A three-level (VSC) built with 1200-V IGBTs is compared to a VSC built with 1200-V IGBTs. The efficiency of the three-level converter can be improved if the neutral point clamped (NPC) converter is designed with 600-V devices. Because of the reduced conduction losses and high





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### 1. INTRODUCTION

Recently, there has been a lot of interest in energy conversion in the low voltage region. Automotive inverters, PFC rectifiers, and photovoltaic grid inverters are just a few examples of applications. Systems using inverters must be very efficient while being inexpensive. must have passive components that are small and affordable. The switching frequency is frequently raised to a medium level range of 12–25 kHz, which causes higher switching losses and worse efficiency. System effectiveness Acoustic noise might also be a problem. Avoid attempting to decrease acoustic noise. essential in aeroplane applications and high-speed drives. It's typical to use high control and output frequencies up to 1 kHz. A requirement for bandwidth exists. Here, the exchanging is completed. According to earlier studies, multilevel topologies have a high degree of complexity. The efficiency of the converter has a flat relationship with the switching frequency [1], [2]. The assertiveness of the 3-level T-type converter (3LT2C) [3–8] for low-voltage applications is demonstrated in this study. In comparison to the three-level NPC topology, the T-type uses an active bidirectional switch at the dc-link voltage midpoint and uses two less diodes per bridge leg. It's a more straightforward three-level topology than active neutral point clamped converters [9]– [11] or split-inductor converters [12], [13]. The 3LT2C combines the benefits of two-level converters, such as low conduction losses, small part count, and a straightforward operation concept, with the benefits of three-level converters, such as reduced switching losses and higher output voltage quality. If a two-level voltage source converter is used, A three-level (VSC) built with 1200-V IGBTs is compared to a VSC built with 1200-V IGBTs. The efficiency of the three-level converter can be improved if the neutral point clamped (NPC) converter is designed with 600-V devices. Because of the reduced conduction losses and high

## A RAPID GROWTH IN DESIGNING AND DEVELOPMENT OF ZERO RADIUS SOUND EXTINGUISHER SYSTEM

<sup>1</sup>K.Baba Saheb, <sup>2</sup>K Chandrakanth, <sup>3</sup>Durgaprasad Rapolu, <sup>4</sup>Afsar Ali

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### Abstract

Since the Industrial Revolution, human progress has grown quickly and the structures have become skyscrapers and their inside has gotten muddled. Another blaze concealment technique is expected to stifle or forestall fire in different situations because of the difference in putting out fires condition. The Sori Sound Engineering Research Institute (SSERI) applied a special acoustic lens to the Sound Extinguisher to focus the sound energy. The wind speed of the sound beam was estimated, when the converse stage sound was provided to the sound beam, the wind speed was lost and the sound level was decreased by around 20 dB. The characteristics of a sound beam formed by a special acoustic lens and how efficiently a sound beam transmits sound energy through experiments are investigated. Sound Fire Extinguisher utilizes an acoustic focal point to limit the constriction of sound vitality and move vitality to the objective point. It can forestall ablaze by bringing down the surrounding temperature even before the fire. In this examination, we tested to check whether the Sound Fire Extinguisher could forestall fire by bringing down the surrounding temperature. Test results show that when the Sound Fire Extinguisher sound part of a similar breeze speed is provided, the warmed silverware is cooled by 10 ~ 20% quicker than the breeze speed of 2m/s. These outcomes show that the Sound Fire Extinguisher can be utilized to forestall blazes since the sound segment of the Sound Fire Extinguisher itself advances the encompassing warm dissemination to cool rapidly.

**Keywords:** Fire Extinguisher, Sound Fire Extinguisher, acoustic lens

### Introduction

Nowadays, machinery and robotic design become important in helping humans. This Fire Protection Robot was designed to help people in any destructive burnt situation where this robot can extinguish burnt areas immediately using an autonomous system. In real life, a destructive burnt area often happens without our realization. Therefore, this type of robot will require a high demand in the market because of its usefulness to humans as well as the environment transmitting fire information to a cell phone using GSM modem. The objective of the project will be to design an SMS electronic Fire Protection Robot toolkit which can replace the traditional Fire Protection Robot. The toolkit sends the fire and sends SMS to the owner of the house, The system is made 2 efficient by SIMs so that the SMS can be received by a number of device boards in a locality using techniques of time division multiple access. The GSM modem receives the SMS. The AT commands are serially

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## EXAMINE THE DURABILITY AND STRENGTH OF CONCRETE THAT HAS BEEN REPLACED WITH FLY ASH AND SILICA FUME

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### ABSTRACT

Numerous studies have been conducted, and the previous several decades have been widely anticipated as the self-compacting concrete period. Concrete with self-compacting qualities is still very much in the early phases of development in India. Although there have been a few attempts over the past several years, the expense of producing this type of concrete continues to be a difficult problem for modern concrete engineers. Therefore, an effort is made in the current study to comprehend the impact of copper slag as a mineral additive on the characteristics of self-compacting concrete. Therefore, our goal is to create SCC that is more affordable, reliable, and sustainable by employing mineral admixture. The Fly Ash and Silica Fumes are essentially by-products of industry. In this investigation, the ideal percentage of these by-products for partial replacement of cement is studied in respect of their resulting concrete's strength properties. For fly-ash, 5%, 10%, 15%, 20%, 25%, 30% and 35%, of replacement is tried and for silica fume, 0%, 4%, 6%, 8%, and 10%, of replacement is tried to arrive at their optimal replacement to get the desired strength and durability properties of the concrete. Compressive strengths were tested on cubes, split tensile strengths were tested on cylinders and flexural strengths were tested on beams. The specimen's durability properties were tested with sulphate and acid attacks.

**Keywords:** Self compacting concrete, Admixture, silica fume, fly ash, Durability test, Strength test.

### INTRODUCTION

Concrete, a combination of cement, sand, coarse aggregate, and water, is one of the most widely used building materials. It is employed in the construction of dams, roads, tanks, offshore projects, and canal lining in addition to multi-story buildings. The process of choosing the right concrete materials and figuring out their proportions with the goal of generating a concrete with the required strength, durability, and workability as quickly as possible is known as the concrete mix design. The compressive strength of hardened concrete is sometimes regarded as a measure of its additional qualities, and it depends on a variety of parameters, such as the value and quantity of cement, water, and aggregate, as well as the batching, mixing, placement, compaction, and curing. The real cost of concrete is connected to the cost of the materials essential for produce a minimum mean strength called characteristic strength that is specific by designer of the structures. This depends on the quality control measures but there is no doubt that quality control add to the cost of concrete. The level of quality control is often an inexpensive cooperation and depends on the size and type of job now a days engineers and scientists are trying to enhance the strength of concrete by adding the several other economical and waste material as a partial substitute of cement or as a admixture fly ash, silica fume, steel slag etc are the few examples of these types of materials. These materials are generally by-product from further industries for example fly ash is a waste product from power plants and silica fume is a by-product resulting from decrease of high purity quartz by coal or coke and wood chips in an electric arc furnace during production of silicon metal or ferrosilicon alloys.

The use of micro silica as a pozzolana material has enhanced in recent years because when mixed in definite proportions it improves the properties of both fresh and hard concrete like durability, strength, permeability and compressive strength, flexural strength and tensile strength.

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## A RESEARCH ON THE MECHANICAL PROPERTIES OF A TITANIUM ALLOY USING HEAT TREATMENT

<sup>1</sup>R.Surendra Rao, <sup>2</sup>Ch Dhanraj, <sup>3</sup>Sindhu Punna, <sup>4</sup>Podicheti Rajashekar

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### Abstract

In this work, an attempt was made to understand the effect of heat treatment on the mechanical properties and micro structure changes of Ti-6Al-4V alloy. This alloy was subjected to heat treatment process at the temperature of 900°C for a duration ranging from 1hr to 6hrs followed by air cooling. Room temperature tensile tests were carried out up to failure at the strain rate  $1 \times 10^{-3} \text{ s}^{-1}$ . Vickers hardness of the as-received and heat-treated Ti-6Al-4V alloy was measured using the load of 500g for the dwell time of 10sec. Microstructure examinations were made using optical microscopy, which revealed morphological changes.

**Keywords:** Ti-6Al-4V alloy, Microstructure, Mechanical Testing and Heat-Treatment.

### 1. Introduction

Development of titanium aluminide (Ti-Al) based alloys has generated a huge interest for many high temperature industrial applications due to their extensive properties. Metastable  $\beta$  titanium alloys are widely used in the biomedical, automotive, and aerospace industry, due to their excellent corrosion resistance, fatigue strength, biocompatibility, and easy formability[1]. In literature research, it has been found that heat treatment types such as cryogenic treatment and precipitation hardening can be applied efficiently to the alloys. Titanium is an exotic metal that possesses a unique combination of mechanical, chemical, and physical properties[2]. Titanium is element number 22 on the periodic table. It is a metal that's silver in colour, found naturally on earth. Titanium alloys are alloys that contain a mixture of titanium and other chemical elements. Such alloys have very high tensile strength and toughness [3]. Titanium alloy are classified as alpha titanium, beta titanium, or alpha-beta titanium. We will be conducting experiments on Ti (grade 5) and study/analyze the behavior of Titanium[4].

### 2. Method & Material

#### 2.1 Material selection and sample preparation

The raw material received experimental metal was procured in the form of a plate. The dimension of the plate are 300mmx150mmx14mm. The chemical composition of the material are given in the Table1. The material used for the experiment is shown in the Fig 1. And the samples for the tensile test and compression test are cut in the dimension as shown in the Fig 2(b) & Fig 2(c) respectively.

Fig.1. Titanium (Ti-6Al-4v)



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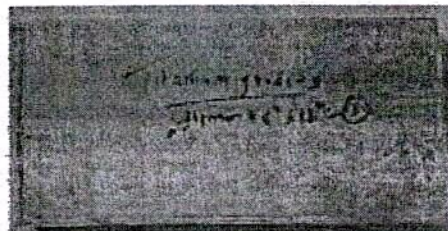
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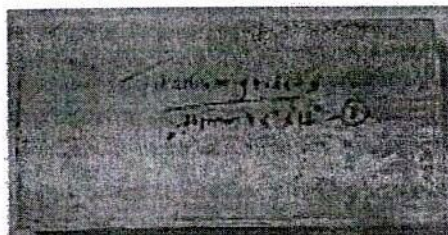
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## PERFORMANCE ANALYSIS ON FLEXURAL FATIGUE FOR FIBER REINFORCED COMPOSITE ALMINATES

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### ABSTRACT

The majority of applications now substitute composites for traditional materials. High specific strength, stiffness, higher fatigue life, wear resistance, and corrosion resistance are all characteristics of composites. The characteristics of laminated composite make it difficult to find the best design options. Components with rotational and cyclic loads, such as wind turbine rotors, leaf springs, and aircraft wing structures, frequently experience flexural fatigue failure. With the aid of the findings of experimental tests, we concentrate on critical examination of various attributes in order to comprehend the impact of frequency on the fatigue failure behaviour. The composite laminates' cyclic varying loads are to blame for this. Our effort aims to create an experimental method for flexural fatigue of composite laminate analysis loading criteria. Several tests are conducted including tensile test and performance of flexural fatigue was evaluated.

**Keywords:** Tensile test, Fiber Reinforced Composite Laminates, Glass-reinforced polymer, Ultimate Tensile strength, Flexural fatigue.

### 1. INTRODUCTION

Mechanical performance, lifetime service, and manufacturing costs were discovered to be important elements that must be taken into account in a variety of applications. In the aforementioned applications, it was found that the majority of industrial and structural applications exposed these composite materials to long-term repetitive loading and unloading conditions known as fatigue were likely to fail after a specific number of cycles. Additionally, the term "fatigue" was used to refer to the process through which a material undergoes architectural degradation after being exposed to varying pressures and strains (Arif et al., 2014). Additionally, it was shown that in certain applications, high fatigue loading damages the material, causing considerable deformation and fracture in several places that results in causes the restriction in sustaining the load. Fatigue was also defined as the number of cycles the material will undergo stress before the damage is caused concerning service and life of the material (Bijelic-Donova et al., 2016).

Presently, Glass fiber-reinforced polymeric (GFRP) composites were found to be a significant factor in the manufacturing of composite materials. The properties and behavior of the fiber-reinforced composite were found to depend on numerous factors such as the fiber strength, the chemical stability, matrix strength and the bonding between the fiber and matrix in order to allow the stress transfer. The mechanical properties of the composites were found to be enhanced by the use of various GF reinforcements like long longitudinal, woven mat, chopped fiber, and chopped mat (Sathish kumar et al., 2014). Furthermore, the properties of composites were observed to be depended on the fibers laminated in the matrix while preparing the composites. The major limitation of the polymers in numerous commercial applications was concerned with the high cost. Besides, composite materials were noticed to have a wide range of industrial applications, and in addition, glass fiber reinforced composite materials were found to have an excellent resistance towards the environmental, higher tolerance level for impact loading, high specific strength, and stiffness (Raja et al., 2014).

## PERFORMANCE ANALYSIS ON FLEXURAL FATIGUE FOR FIBER REINFORCED COMPOSITE ALMINATES

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### ABSTRACT

The majority of applications now substitute composites for traditional materials. High specific strength, stiffness, higher fatigue life, wear resistance, and corrosion resistance are all characteristics of composites. The characteristics of laminated composite make it difficult to find the best design options. Components with rotational and cyclic loads, such as wind turbine rotors, leaf springs, and aircraft wing structures, frequently experience flexural fatigue failure. With the aid of the findings of experimental tests, we concentrate on critical examination of various attributes in order to comprehend the impact of frequency on the fatigue failure behaviour. The composite laminates' cyclic varying loads are to blame for this. Our effort aims to create an experimental method for flexural fatigue of composite laminate analysis loading criteria. Several tests are conducted including tensile test and performance of flexural fatigue was evaluated.

**Keywords:** Tensile test, Fiber Reinforced Composite Laminates, Glass-reinforced polymer, Ultimate Tensile strength, Flexural fatigue.

### 1. INTRODUCTION

Mechanical performance, lifetime service, and manufacturing costs were discovered to be important elements that must be taken into account in a variety of applications. In the aforementioned applications, it was found that the majority of industrial and structural applications exposed these composite materials to long-term repetitive loading and unloading conditions known as fatigue were likely to fail after a specific number of cycles. Additionally, the term "fatigue" was used to refer to the process through which a material undergoes architectural degradation after being exposed to varying pressures and strains (Arif et al., 2014). Additionally, it was shown that in certain applications, high fatigue loading damages the material, causing considerable deformation and fracture in several places that results in causes the restriction in sustaining the load. Fatigue was also defined as the number of cycles the material will undergo stress before the damage is caused concerning service and life of the material (Bijelic-Donova et al., 2016).

Presently, Glass fiber-reinforced polymeric (GFRP) composites were found to be a significant factor in the manufacturing of composite materials. The properties and behavior of the fiber-reinforced composite were found to depend on numerous factors such as the fiber strength, the chemical stability, matrix strength and the bonding between the fiber and matrix in order to allow the stress transfer. The mechanical properties of the composites were found to be enhanced by the use of various GF reinforcements like long longitudinal, woven mat, chopped fiber, and chopped mat (Sathish kumar et al., 2014). Furthermore, the properties of composites were observed to be depended on the fibers laminated in the matrix while preparing the composites. The major limitation of the polymers in numerous commercial applications was concerned with the high cost. Besides, composite materials were noticed to have a wide range of industrial applications, and in addition, glass fiber reinforced composite materials were found to have an excellent resistance towards the environmental, higher tolerance level for impact loading, high specific strength, and stiffness (Raja et al., 2014).

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## **REALIZATION OF HIGH SPEED VECTOR CONTROL SRM ON ELECTRIC VEHICLES**

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### **ABSTRACT**

The high speed motor works well to accomplish motor reduction in an electric vehicle (EV). Due to the rotor's straightforward and durable construction, Switched Reluctance Motors (SRM) is appropriate for high speed drives. The tremor and acoustic noise are substantial, though, which is a drawback. Additionally, the complexity of the unipolar current excitation contributes to the challenge of designing a torque controller. For SRM, the vector control has been suggested as a solution to these issues. The SRM, however, has not been subject to vector control in the high speed zone. This study clarifies the drive conditions for applying vector control to the SRM in the high speed zone, such as switching frequency and bus voltage. It is shown by the experiment that the proposed SRM can be driven by the vector control in the high speed region and can realize the high output power and low vibration.

**Keywords:** Switched reluctance motor, high speed drive, Vector control

### **1. INTRODUCTION**

Gas emissions must now be drastically reduced due to their impact on the ozone layer due to a growing outcry from environmental activists and government legislation [1]. Internal Combustion Engines (ICE) power conventional transportation systems (vehicles), which cause the environment to be harmed by the burning of gas and fuel into hydrocarbon oxides. While research has focused on renewable energy sources, it has also advanced and evolved hybrid electric vehicles (HEVs), which employ both internal combustion engines and electric motors to move their wheels [2-4]. Additionally, fully electric vehicles (EVs) have been available and operating since that time [5]. These automobiles are propelled by one or more electric motors [6]. Researchers are now exploring use of renewable energy including solar, wind and tidal waves for sustainable mobility [7-10].

An electric vehicle consists of three major subsystems; the energy source subsystem, the auxiliary subsystem and the electronic propulsion subsystem [3,11,12]. The electronic propulsion subsystem comprises an electronic controller, the power converter, the mechanical transmission and the electric motor. In this work, a review of different motors available as propulsion for electric vehicle is presented (Fig. 1).



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## IDENTIFYING AND ELIMINATING THE CURRENT AND FUTURE PROBLEMS IN A COMPANY USING FAILURE MODE EFFECT ANALYSIS

<sup>1</sup>N.Sandeep Kumar, <sup>2</sup>Ch Swathi, <sup>3</sup>Srinivas Balasani, <sup>4</sup>Md Sharique

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### ABSTRACT

A small-scale industry relies heavily on quality. The main industries that care about the product's quality, price, and turnaround time are their clients. The purpose of this essay is to find and fix present and potential issues in a business. Failure mode effect analysis and the Ishikawa diagram are used to cut down on mistakes, speed up product development, and improve product dependability. Additionally, it broadens the knowledge base of small manufacturing firms. Risks for the present and future are so highlighted. Current controls are assessed, and proactive risk-reduction measures are suggested. Additionally, several precautions are suggested to be performed as soon as feasible to reduce potential dangers. Failure modes are the potential paths or ways that something may go wrong. Failures are any defects or errors, especially ones that affect the customer and can be potential or actual. Effect Analysis refers to studying the consequences of those failures (Pyzdek T.2003). Failures are prioritized according to how serious their consequences are, how frequently they occur, and how easily they can be detected. The purpose of FMEA is to take actions to eliminate or reduce failures, starting with the highest priority number (Florina C.F.2002).

Implementing standard operating procedures and proper training in process execution go a long way towards achieving consistency in producing high quality parts with minimal waste. This is especially true when comparing part variations produced by multiple operators with different skill levels (Gowen 2002).

**Keywords:** Quality, Bending process, Failure mode effect analysis, Ishikawa diagram, precision press parts, press brake, product reliability, potential risk, sheet metal parts.

### 1. INTRODUCTION

In order to prevent rework and loss of both time and resources, press brake setup must be exact and efficient (Dale B.G. 1999). Since no parts are being produced from a manufacturing standpoint, the setup is the most expensive element of any process. Proper training and operating procedures for repeated tasks through a standard setup process can assist give superior outcomes in order to attain both accuracy and speed (Melan E.H.1995). One of the most challenging devices to operate in a facility that fabricates precise metals is the press brake.

Despite all the advancements in technology, the operator still requires the knowledge and abilities to consider all the procedures involved in creating the component and to foresee any issues (Pande S.2000). modern press brakes have many features to take the guesswork and art out of bending with thickness compensators, automatic



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## INCREASING THE EFFECIENCY OF JOINTS BY USING FRICTION PLUG WELDING METHOD

<sup>1</sup>K.Prahalad Reddy, <sup>2</sup>Dr. G Sai Prasad, <sup>3</sup>Bharath Azmeera, <sup>4</sup>Suleman Miyan  
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### ABSTRACT

Friction plug welding (FPW) does not require the use of external heat or the joining of molten materials to join two unlike or comparable materials. Because no melting takes place throughout the process, friction welding is more of a fake than a true fusion welding technique. By interpolating heat sources or preheating the work piece surface, joins can be made more effective. The friction coefficient must also be taken into account when calculating the heat flux produced at the mean surface. By adjusting the plug's diameter and watching how the temperature distribution is impacted, one may alter the width of the land. By using mathematical and analytical model formulas, it is possible to determine the impact of pre-heating. The temperature distribution values were calculated for a variety of plug sizes and pre-heating temperatures ranging from 2500C to 5500C. The values were determined even while the work piece was in operation. It was decided to employ the response surface analysis approach in this study in order to find out how different parameters affect the tensile strength of 6082 aluminium alloy friction plug welding (FPW) joints. The temperature field and force analysis were used to determine why the root of the joint seems to be a weak zone. The explanation for this appearance was explained. According to the findings, the rotational speed was more important than the upsetting speed and the welding time in determining the tensile strength of FPW joints.

**Keywords:** Friction stir welding, Friction plug welding, Heat, Friction, Temperature, Hardness, Tensile etc.

### I. INTRODUCTION

One of these manufacturing methods is called fractional welding, and it includes the friction between the two materials being fused creating heat. This method is currently in use in businesses all over the world as a reliable and automated welding operation, and it is gaining popularity.

A solid-state joining method called fractional welding causes material to coalesce under the compressive force of rotating work pieces, producing heat and plastic material displacement from rubbing surfaces without the necessity of melting. This method does not need the use of flux filters or metal filters [1].

Friction Solid-state stir welding is being used to weld difficult-to-weld aluminium alloys of various series, which is a solid-state technique. Because of the lack of melting and resolidification of the metal, the weld is free of



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## **AN EFFECTIVE MANUFACTURING TECHNOLOGY FOR HIGH ACCURATE PROCESSING OF POWDER MIXING USING EDM TECHNOLOGY**

<sup>1</sup>K Swathi, <sup>2</sup>K.Suresh, <sup>3</sup>M Manasa Priyadarshini, <sup>4</sup>Md Aamir

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### **Abstract**

Regardless of the mechanical characteristics of all electrically conductive materials, electric discharge machining (EDM) is one of the most effective production techniques. It is a non-contact thermal energy method used in a variety of industries, including aerospace, automotive, tools, moulds and dies, and surgical implements. It is particularly effective for cutting difficult-to-cut materials with simple or complicated forms and geometries. One of the process's early large-scale applications was to moulds, tools, and dies. These products are particularly challenging to mill because they are constructed of difficult-to-machine materials, have extremely complicated, highly accurate forms, and have surface properties that are delicate to machining conditions. The review of this kind with an emphasis on tool and die materials is extremely useful to relevant professions, practitioners, and researchers. This review provides an overview of the studies related to EDM with regard to selection of the process, material, and operating parameters, the effect on responses, various process variants, and new techniques adopted to enhance process performance. This paper reviews research studies on the EDM of different grades of tool steel materials.

**Key words:** EDM, PMEDM, MRR, SR

### **INTRODUCTION**

Rapid advancements in recent years in the transportation, medical technology, aerospace, and many other industrial sectors have raised the demand for innovative materials with advantageous properties. Most contemporary materials require sophisticated production techniques in addition to having distinctive properties that make them easy to manufacture. Most of these materials are often challenging to cut using standard production techniques. These materials' distinctive properties expand their uses, which encourages manufacturers to research novel machining techniques that are both affordable and precise. One of the most cutting-edge manufacturing techniques, electric discharge machining (EDM), is used to successfully manufacture conductive materials that are challenging to cut. Modern companies frequently employ EDM as the preferred method to manufacture difficult-to-cut materials in order to promote precise machining, complicated form machining, and better surface integrity. The process is utilized to machine electrically conductive materials by applying repetitive sparks between electrode and workpiece. Unlike in mechanical machining, no deforming





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Regardless of the mechanical characteristics of all electrically conductive materials, electric discharge machining (EDM) is one of the most effective production techniques. It is a non-contact thermal energy method used in a variety of industries, including aerospace, automotive, tools, moulds and dies, and surgical implements. It is particularly effective for cutting difficult-to-cut materials with simple or complicated forms and geometries. One of the process's early large-scale applications was to moulds, tools, and dies. These products are particularly challenging to mill because they are constructed of difficult-to-machine materials, have extremely complicated, highly accurate forms, and have surface properties that are delicate to machining conditions. The review of this kind with an emphasis on tool and die materials is extremely useful to relevant professions, practitioners, and researchers. This review provides an overview of the studies related to EDM with regard to selection of the process, material, and operating parameters, the effect on responses, various process variants, and new techniques adopted to enhance process performance. This paper reviews research studies on the EDM of different grades of tool steel materials.

**Key words:** EDM, PMEDM, MRR, SR

### **INTRODUCTION**

Rapid advancements in recent years in the transportation, medical technology, aerospace, and many other industrial sectors have raised the demand for innovative materials with advantageous properties. Most contemporary materials require sophisticated production techniques in addition to having distinctive properties that make them easy to manufacture. Most of these materials are often challenging to cut using standard production techniques. These materials' distinctive properties expand their uses, which encourages manufacturers to research novel machining techniques that are both affordable and precise. One of the most cutting-edge manufacturing techniques, electric discharge machining (EDM), is used to successfully manufacture conductive materials that are challenging to cut. Modern companies frequently employ EDM as the preferred method to manufacture difficult-to-cut materials in order to promote precise machining, complicated form machining, and better surface integrity. The process is utilized to machine electrically conductive materials by applying repetitive sparks between electrode and workpiece. Unlike in mechanical machining, no deforming



## **AN EFFECTIVE MANUFACTURING TECHNOLOGY FOR HIGH ACCURATE PROCESSING OF POWDER MIXING USING EDM TECHNOLOGY**

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## **A SUPERSONIC X-48B AIRCRAFT'S HONEYCOMB STRUCTURE AND BLENDED WING DESIGN IMPACT**

<sup>1</sup>M.surendar, <sup>2</sup>Durgaprasad Rapolu, <sup>3</sup>Ganapathi Kanaji, <sup>4</sup>Md Aslam

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### **ABSTRACT**

An aircraft's construction must be able to endure all predicted mission loads. It is intended to have the appropriate safety margins and the ideal structural weight. By visualising the distributions of structural stress, deflection, strain, and margins of safety, the design is enhanced. The nodes of the structure are found to have higher levels of elasticity, stiffness, strength, and stress distribution. The blended-wing-body vehicle construction and sophisticated composite materials are also taken into consideration in the current application. For the design of weight-critical structures, sandwich architecture with two thin facing layers and a substantial core has benefits. Aluminum alloys, high-tensile steels, titanium, or composites are employed as the material for the facings skins, depending on the unique needs of the constructions.. Several core shapes and material may be used in the construction of sandwich among them. It is also observed that aluminum honeycomb core has excellent properties with respect to weight savings and fabrication costs. The blended wing aircraft NASA X-48B is implemented by honeycomb structure to achieve the highly specified properties of an advanced aircraft.

**Keywords :** Honeycomb structure, Morphed, Fabric Wing, Optimization, Loads, Stress, Lift Force.

### **I. INTRODUCTION**

In this work, we'll use the honeycomb structure to do a static structural study of a blended-wing aircraft wing devoid of ribs and spars. The employed construction improves strength while reducing weight. The x-48 B's wing NASA's aircraft has been redesigned as a sandwich wing, with a core made of a hexagonal honeycomb structure that serves as a load-bearing structure while using less material overall. The stress will be decreased by employing the sandwich architecture since it will spread throughout the nodes and lessen stress. Because the blended wing body has fewer connections, it is simpler to adopt a honeycomb structure when building wings. The blended wing shear leads and, air load, are less because of the design of the BWB Aircraft the honeycomb structure which is made for the stress with stand capacity. The structure had honeycomb structure, over the wing and it has less weight to increase the efficiency. So the passenger load and efficiency may be increased. Economically it is useful for the subsonic passenger aircraft. The Boeing 797 is one of the BWB passenger, aircraft, the weight will reduced about 25% because to reduce material usage.



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## SMART WIRELESS LOCKING SYSTEM BASED ON THE IOT AND OTP USING ARDUINO

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### ABSTRACT

This project proposes an OTP (On Time Password) based digital wireless locking system combined with Bluetooth to increase the level of security. Every time we try to unlock the locker system, a new password is generated. Here we need to use a DIY smart lock mechanism to avoid security threats, and require App development to control the switch mechanism. Develop the application using MIT App Inventor (web application) and initialize the Bluetooth list with the coding blocks to connect to the corresponding smartphone. Here we are using an Arduino UNO (ATmega328P based microcontroller board) which works according to a program written in the Arduino IDE (Integrated Development Environment). The programming language used is similar to C, and the code should be uploaded to the Arduino board via USB Type-B for execution. The app fragment consists of a lock icon, a Bluetooth icon, and a key icon. When we connect Bluetooth (Hc05) and press the lock icon, the device ID is sent to the circuit. If the ID matches the ID initialized in the Arduino code, the OTP loop is triggered. After successfully mapping the OTP, unlock the lock by pressing the key icon. This is indicated by a lit LED light. This is an IOT (Internet of Things) based application that keeps sensitive data safe and avoids risks from internal and third-party sources.

**Keywords:** OTP (On Time Password), DIY (Do It Yourself), MIT App Inventor (Web Application), Bluetooth Hc-05, IOT (Internet of Things), IDE (Integrated Development Environment), USB (Universal Serial Bus).

### 1. INTRODUCTION

The Internet of Things (IoT) is a concept revolving around a global information network consisting of "things" such as smart devices, sensors and actuators, or even smaller networks with their own identities and self-configuration capabilities within a certain range. extent to make their own decisions, either individually or collectively. The advent of the Internet of Things heralds a future where everything and everyone will be connected to the internet through any device they own, be it a computer, smartphone or other consumer device. Objects in an IoT network can also communicate using various communication technologies, such as WIFI, Bluetooth, near field communication, and more.

One of the most common uses of IoT technology is to support smart home systems. Newer smart home systems are a good model for how IoT architectures behave, as objects in a house are wirelessly connected to gateways to communicate with each other and the occupants of the house. Since smart home systems are designed to improve the comfortable quality of life for residents, using IoT can at least make it easier to control and monitor household appliances.



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## CONSTRUCTION OF LOW POWER, IMPROVED WRITE ABILITY SRAM FOR SPACE APPLICATIONS

<sup>1</sup>Dr.N.Ashok Kumar, <sup>2</sup>P.Chandra Mani, <sup>3</sup>K.Srikanth, <sup>4</sup>G.Lakshmi

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### ABSTRACT

SRAM(Static Random Access Memory) Cell for advanced space applications must achieve high performance to meet the ever increasing data rates of space systems and must be radiation hardened to ensure reliable operation in harsh environment. The operation of the SRAM memory cell is relatively straight forward. Access to the SRAM cell is enabled by the Word Line(WL). This controls the two access control transistors which control whether the cell should be connected to the Bit Lines(BL).These two lines are used to transfer data for both read and write operations. There are three modes of operations in SRAM cell. SRAM cell often need to be less power power hungry and should have enhanced performance.So, a new SRAM cell is proposed which has higher critical charge and lower write delay/power.The proposed DWA12T SRAM cell has lower enhanced critical charge which makes it suitable for space applications. All designs were implemented using Hspice in 16nm technology for varying supply voltages.

**KEYWORDS:** SRAM, Stability, Write delay, Read delay, Low leakage power, Soft error issue.

### I. INTRODUCTION

The applications of satellite communication are ubiquitous. From weather forecasting to navigation systems, military surveillance to television, the benefits that the modern world reaps from satellites are endless. With an improvement in technology, there is an inclination toward building lowcost and lightweight satellites [1]. This is because the greater the mass, the greater the cost involved in manufacturing, launching, and maintaining it in space, all of which must be recovered through communication sales over the lifetime of the satellite. Due to the limited resources that a low-cost satellite can be equipped with, there is a major demand for high-density memory devices that are capable of withstanding harsh space radiations with long battery lives [2]. SRAM cells, due to their high packaging density and the ability to provide improved logic performance, are a reasonable choice for space applications [3], [4]. The most effective way of curtailing power dissipation to lengthen battery life in SRAM cells is by downscaling of supply voltage (VDD). This is because standby power reduces exponentially and dynamic power reduces quadratically with VDD [5].

This, however, leads to a plethora of problems. The SRAM cell becomes more susceptible to soft errors, being it in the form of single-cell upsets (SCUs), where a single bit of data is affected, or multiple-cell upsets (MCUs), where multiple bits of data are affected, as supply voltage is decreased. This is because the critical charge  $Q_c$ , which is defined as the minimum amount of charge required to flip the stored data in an SRAM cell when subjected to space radiations such as high-energy  $\alpha$  particles, reduces with  $V_{DD}$  [5]. Moreover, the chances of threshold voltage ( $V_t$ ) mismatch between the adjacent transistors in a memory cell increase as



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## DENOISING OF ECG SIGNAL USING EFFECTIVE HYBRID WINDOW FUNCTION

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### ABSTRACT

The main objective of this project is to denoise the Electrocardiogram signal which is corrupted by additive white gaussian noise. The noise may interrupt during an ambulatory patient monitoring in wireless ECG recording environment. So, in order to accomplish this objective an effective hybrid window function is established. A hybrid window function is proposed and a linear phase FIR low pass filter is designed by using the proposed windowing technique. The outcome of hybrid window is the multiplication of Blackman and flattop windows with an altered window coefficient. For proper identification, even at low SNR it is necessary to receive noiseless signal. Based on the relative analysis with other existing window functions the filter which is designed by proposed hybrid window function have qualified transition bandwidth. Even at low SNR, the ECG denoising is more accurate when filtered with designed hybrid window technique.

**Key words:** FIR filters, Electrocardiogram signal (ECG), Additive white gaussian noise, Hybrid window functions, Transition Bandwidth.

### I. INTRODUCTION

The main purpose of filters is to eliminate the unwanted signal which is mixed within the original signal. These filters are classified into two types Analog filters and digital filters[6]. Among them digital filters give more accurate results for providing the valid outputs with the given input signals. These digital filters do not harm any component within the circuitry and simple to test and implement on any workstation. Despite of any changes in time and temperature, digital filters are extremely capable for responding and maintain its stability. So, digital filters plays a vital role in processing. Digital filters are classified into two major types like FIR [5](finite impulse response) and IIR (infinite impulse response). The selection of filter mainly depends on the design characteristics. One of them is linear phase[20]which prevent the loss of information. From this we can refer that FIR filters have linear phase characteristics and higher filter order which is more stable.

FIR filters are also known as non-recursive digital filters as they do not have the recursive part of a filter. The filter order and window functions come into existence whenever the characteristics of the transfer function and as well as its deviation from the ideal frequency response are evolved[17].



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### ABSTRACT

The main objective of this project is to denoise the Electrocardiogram signal which is corrupted by additive white gaussian noise. The noise may interrupt during an ambulatory patient monitoring in wireless ECG recording environment. So, in order to accomplish this objective an effective hybrid window function is established. A hybrid window function is proposed and a linear phase FIR low pass filter is designed by using the proposed windowing technique. The outcome of hybrid window is the multiplication of Blackman and flatop windows with an altered window coefficient. For proper identification, even at low SNR it is necessary to receive noiseless signal. Based on the relative analysis with other existing window functions the filter which is designed by proposed hybrid window function have qualified transition bandwidth. Even at low SNR, the ECG denoising is more accurate when filtered with designed hybrid window technique.

**Key words:** FIR filters, Electrocardiogram signal (ECG), Additive white gaussian noise, Hybrid window functions, Transition Bandwidth.

### I. INTRODUCTION

The main purpose of filters is to eliminate the unwanted signal which is mixed within the original signal. These filters are classified into two types Analog filters and digital filters[6]. Among them digital filters give more accurate results for providing the valid outputs with the given input signals. These digital filters do not harm any component within the circuitry and simple to test and implement on any workstation. Despite of any changes in time and temperature, digital filters are extremely capable for responding and maintain its stability. So, digital filters plays a vital role in processing. Digital filters are classified into two major types like FIR [5](finite impulse response) and IIR (infinite impulse response). The selection of filter mainly depends on the design characteristics. One of them is linear phase[20]which prevent the loss of information. From this we can refer that FIR filters have linear phase characteristics and higher filter order which is more stable.

FIR filters are also known as non-recursive digital filters as they do not have the recursive part of a filter. The filter order and window functions come into existence whenever the characteristics of the transfer function and as well as its deviation from the ideal frequency response are evolved[17].



## DENOISING OF ECG SIGNAL USING EFFECTIVE HYBRID WINDOW FUNCTION

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## A MIXED MODELS AUTOMATED SYSTEM FOR DETECTING DIABETIC RETINOPATHY

<sup>1</sup>A.Dhanraj, <sup>2</sup>Rajendhar, <sup>3</sup>L.Prathima, <sup>4</sup>A.Upendhar Reddy

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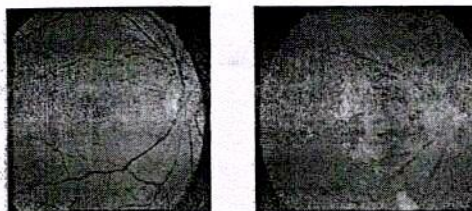
Diabetic Retinopathy (DR) is an eye fixed disease caused due to diabetes. During this disease, there's a progressive damage to the retina if the high glucose levels aren't controlled. DR is classified as Non Proliferative Diabetic Retinopathy (NPDR) and Proliferative Diabetic Retinopathy (PDR). During this paper, we propose a sturdy automated system which detects and classifies the various stages of DR. The intended work follows pre-processing, feature extraction and feature classification steps. The pre-processing step enhances abnormality presence likewise as segmentation; the extraction step acquires merely relevant features; and also the classification step uses classifiers like support vector machine (SVM), K-nearest neighbour (KNN), and binary trees (BT). Random forest classifier is additionally used for classification and also the results are compared with the said classifiers. To accomplish this, multiple severities of disease grading databases were used and achieved an accuracy of 98.06%, sensitivity of 83.67%, and 100% specificity.

**Keywords:** Support Vector Machine (SVM), K-nearest neighbour (KNN), BinaryTree (BT), Random Forest classifier (RFC), Database (Drive)

### 1. INTRODUCTION

Diabetic retinopathy is an eye fixed disease that happens mostly for the people littered with diabetes. It is a serious disease that has affected over 290 million people globally and 69.2 million people in India. the speed of individuals getting affected will increase exponentially within the coming years. The disease is linked to the fundus of the attention and may have adverse effects on the patient, if in the least left undiagnosed respectively. Diabetic Retinopathy occurs when the blood vessels of the retina discharges fluids within the retina which causes exudates within the retina. because of this diabetic patient may lose their vision. Microaneurysms, exudates and haemorrhages causes the vision loss for DR patients. The vision loss become worsens, blood vessels grow within the retina and also the severity increases.

The following are the photographs of healthy retina and diabetic retinopathy retina.





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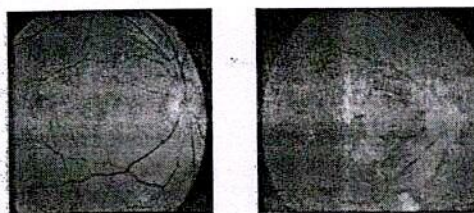
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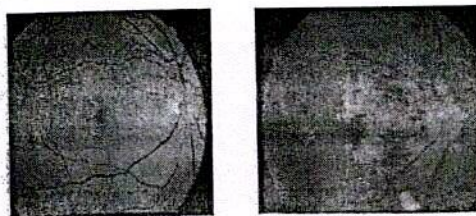
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## **REAL-TIME FACE MASK IDENTIFICATION DETECTION USING IMAGE PROCESSING**

<sup>1</sup>B.Mani Kumar, <sup>2</sup>M.Harshitha Goud, <sup>3</sup>L.Ravi Chandar, <sup>4</sup>B.Minesh

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### **ABSTRACT**

As the rise of Corona-virus has affected at least 188 countries Corona virus disease (covid-19) is an infectious disease caused by the SARS-CoV-2 virus. COVID-19 affects different people in different way. There are some ways to prevent Covid-19 wearing a mask properly is an important factor to prevent from covid19. Properly fitted masks can help prevent the spread of the virus from the person wearing the mask to others. This project presents a precious way to detect the face mask, which is recognized as an important precaution of Covid-19, based on image processing techniques and openCv. The purpose of CNN model is used to extract features from images. The features of face mask detection are automatically sent alert, multi-Channel recognition. Mask detector using Tensor Flow. The face mask detection can be used at airports, to detect travellers without masks.

**Keywords:** Tensor flow keras, convolution Neural network, face recognition and detection, Image processing Open CV Deep Learning & machine learning model, reinforcement Learning, Training Model, video stream, Feature Extraction, Load Dataset, Frame, Face net, Mask net.

### **1. INTRODUCTION**

The COVID-19 virus can be spread through the contact and contaminated surfaces. One of the essential equipment to fight against corona virus is Face mask. In this paper, a face mask detector refers to detect whether a person is wearing a mask or not. In fact, where the face is detected using different machine learning algorithms in many application areas like schools, chemical industries etc. To detect face, there are so many algorithms in machine learning. One of the best algorithms is Computer vision. It is mainly used for digital image applications. This project aims to detect whether a person is wearing a mask or not with accuracy. Here we introducing a face mask detection model that involves machine learning and image processing techniques. In deep learning convolution neural networks which is used to train the models.

### **2. LITERATURE SURVEY**

The primary research on Face detection was done in 2001 using the design of handcraft feature and application of traditional machine learning algorithms to train effective classifiers for detection.

In [1], the authors describe a visual object detection framework that is capable of processing images extremely rapidly while achieving high detection rates. B.QIN at [2] developed conditions for identifying face mask wearing where classification is done as whether a person is properly wearing, not properly wearing and not wearing mask. Shaik at [3] used deep learning face emotion classification and recognition



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## **ANALYSIS ON DETECTION MODULE FOR ASSISTING SIGHT IMPAIRED USING ARDUINO**

<sup>1</sup>K.Harinatha Reddy, <sup>2</sup>Uma Maheshwari, <sup>3</sup>C.Swathi, <sup>4</sup>M.Harshavardhan Reddy  
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A sense of vision is a crucial feature of human beings that is inherently granted by God however some people are unable to visually see things in their environment. Individuals' inability to recognize obstacles, potholes, staircases, pedestrians, vehicles, and other objects in their environment is one of the biggest challenges they encounter in daily life. The major goal is to make navigation easier for visually challenged persons. The sensor computed processor Arduino module is used to demonstrate a system. People who are blind and walking on the roadways will be able to pass through on their own without assistance. This device was created using an Arduino kit and a detecting module to assist the sight impaired in reaching their destination.

**Keywords-** Arduino nano, Ultrasonic sensor, SD module.

### **1. INTRODUCTION**

The World Health Organization (WHO) estimates that 284 million people are blind. Around 39 million of them are blind, with the remaining 245 million suffering from various vision impairments. People aged 65 and up make up the top 60%. As the world advances at a quicker rate, new systems are invented every day to make life more comfortable in every manner conceivable. People with physical limitations, on the other hand, require greater assistance than regular people. As a result, technology has arisen to try to create answers so that they can live in society as regular individuals. The main goal is to help the visually impaired; once an impediment is detected, a verbal warning signal is issued.

This setup provides the solution to reach the destination without any support. This system is designed to detect the obstacles and also the obstacle direction by using Arduino nano. An automatic voice signal is generated indicating the direction immediately whenever the obstacle is present in the given range. This system consists Arduino nano, Ultrasonic sensors, SD module and a speaker. This system detects the obstacle present in the given range and compares the left and the right distance, based on the distance a voice signal is generated whether to move left or right. If the obstacle is detected in front, then immediately the ultrasonic sensors compare the left distance and right distance, if the left distance is more with no objects when compared to right distance then the voice signal is generated such as "turn left".

This system is simple and light in weight. It provides one of the best solutions to assist the visually impaired. The main aim of this system is to provide an efficient way to navigate the visually impaired without any support and not depending on others. This system also helps in reducing the risk and hurts that may occur due to no sense of vision.



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## Improve the Versatility and Quality of Multi-Contrast MRI Tests without the Need for Prolonged Examinations

<sup>1</sup>P.Seetaramaiah, <sup>2</sup>L.Prathima, <sup>3</sup>M.Nikhil Sitharam, <sup>4</sup>D.Nikitha  
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This study's goal was to recommend the best input picture quality for T1- and T2-weighted magnetic resonance imaging (MRI) images that use conditional generative adversarial networks (GAN). A total of 2,024 pictures from 104 patients' scans between 2017 and 2018 were used. GAN was used to develop the prediction frameworks for T1-weighted to T2-weighted MRI pictures and T2-weighted to T1-weighted MRI images. For the input images, two different grayscale level conversion methods (simple and adaptive) and two different image sizes (512 512 and 256 256) were used. Using a straightforward conversion technique, the images were divided into 256 levels to get from 16-bit to 8-bit. In order to employ the adaptive conversion approach, 16-bit images were transformed to 8-bit images by dividing with the value obtained after dividing the maximum pixel value with 256 removing the unwanted levels. The mean absolute error (MAE) was 0.15 for T1-weighted to T2-weighted MRI images and 17 for T2-weighted to T1-weighted MRI images with an adaptive conversion method, which was the smallest. Moreover, the adaptive conversion method has a smallest mean square error (MSE) and root mean square error (RMSE), and the largest peak signal- to-noise ratio (PSNR). The computation time depended on the image size. Input resolution and image size affect the accuracy of prediction. The proposed model and approach of prediction framework can help improve the versatility and quality of multi-contrast MRI tests without the need for prolonged examinations.

**Key words:** Convolutional generative adversarial networks; image synthesis; MRI ; T1 and T2 weighted images.

### 1. Introduction

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## Improve the Versatility and Quality of Multi-Contrast MRI Tests without the Need for Prolonged Examinations

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### ABSTRACT

This study's goal was to recommend the best input picture quality for T1- and T2-weighted magnetic resonance imaging (MRI) images that use conditional generative adversarial networks (GAN). A total of 2,024 pictures from 104 patients' scans between 2017 and 2018 were used. GAN was used to develop the prediction frameworks for T1-weighted to T2-weighted MRI pictures and T2-weighted to T1-weighted MRI images. For the input images, two different grayscale level conversion methods (simple and adaptive) and two different image sizes (512 512 and 256 256) were used. Using a straightforward conversion technique, the images were divided into 256 levels to get from 16-bit to 8-bit. In order to employ the adaptive conversion approach, 16-bit images were transformed to 8-bit images by dividing with the value obtained after dividing the maximum pixel value with 256 removing the unwanted levels. The mean absolute error (MAE) was 0.15 for T1-weighted to T2-weighted MRI images and 17 for T2-weighted to T1-weighted MRI images with an adaptive conversion method, which was the smallest. Moreover, the adaptive conversion method has a smallest mean square error (MSE) and root mean square error (RMSE), and the largest peak signal- to-noise ratio (PSNR). The computation time depended on the image size. Input resolution and image size affect the accuracy of prediction. The proposed model and approach of prediction framework can help improve the versatility and quality of multi-contrast MRI tests without the need for prolonged examinations.

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## AN ADVANCE METHOD FOR IMPROVING REVERSIBLE DATA HIDING IMAGES USING SMVQ AND ENCODING TECHNIQUES

<sup>1</sup>Dr.N.Ashok Kumar, <sup>2</sup>M.Varasundar, <sup>3</sup>A.Dhanraj, <sup>4</sup>D.Vamshi

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### ABSTRACT

Sharing private information has gotten difficult over the last few years as data security has increased. In a number of industries, including the military, the medical profession, networks, and others, exchanging data involves not only concealing signals in multimedia, but also receiving the data without any distortion at the recipient end. In order to protect against intruders, data hiding is thus established, whereby the sender conceals the crucial data into the media. The content owner encrypts an original image using Reversible data hiding in encrypted images (RDHEI), embeds the hidden image using Arnold transform and Side Match Vector Quantization, and transfers it to the recipient. The cover image and the hidden image are sent to the recipient using the Inverse Arnold Transform and in painting. The main purpose is to further improve the PSNR and better data hiding to achieve the best performance. With this, the two metrics PSNR (dB) and the compression ratio can be improved compared to other state of the art schemes and prediction errors are compared and further improved.

**Keywords:** Reversible data hiding, side match vector quantization (SMVQ), Arnold transform, Image in painting.

### 1. Introduction

Regarding security, there are several applications, including military and medical. The primary consideration for both the sender and the receiver is the protection of the information being exchanged. When sending confidential information, the information shouldn't be lost until it reaches the intended recipient. Data concealing is one of the techniques that is most frequently used. This data concealing can be employed in military applications when a secret message or image needs to be sent to the appropriate destination [1]. The secret message that needs to be conveyed may consist of voice, video, or data fragments. In case a secret image is one that needs to be transferred then it can be embedded or encoded in another image which is generally a cover image [2]. After embedding the embedded image will be same as the cover image so that during transmission any unauthorized user cannot access the secret information. It almost preserve the same appearance which is imperceptible [3,4] to any hacker who tries to get the secret information.

In the recent years, many algorithms for embedding the secret data have been proposed. In several data hiding techniques reversible data hiding is one which is mostly suitable for this kind of applications. Using reversible data hiding not only the secret image is hided but also it can extract successfully at the receiver without any distortions. Many reversible data hiding schemes came into existence over the past years [6]. Like the prediction error expansion (PEE), PVO, difference expansion, histogram shifting and soon. As for the embedded methods there are different methods such as time domain, spatial domain, transform domain method. If it is done in transform method then some image scrambling needs to be performed such that in pixel position or values arranged randomly so the image will be visually unreadable. Before transmitting any image or information in order to store it should be compressed before sending. Now as for the compression there different methods such as loss and lossless. If lossy compressing is decided to use then JPEG, JPEG 2000, vector quantization[7] can be used. As for the lossless compression Huffman coding, arithmetic coding, etc can be used.

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## MLP CLASSIFICATION AND IMPLEMENTATION FOR ACCURATE SPEECH EMOTION AND RECOGNITION USING DEEP LEARNING TECHNIQUES

<sup>1</sup>B.Raghupathi, <sup>2</sup>CH.Sangeetha, <sup>3</sup>Asif Ahmed Algur, <sup>4</sup>K.Sumalatha

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### Abstract

One subfield of artificial intelligence is machine learning. This field makes use of models and algorithms to anticipate outcomes more precisely. On the RAVDESS dataset, an experimental study has been conducted to use machine learning to identify the emotions in voice audio files. 24 actors' voice emotions were recorded in 7356 files in this data collection. MLP classifier has been used to increase the reliability of the findings related to emotions.

**Keywords:** MLP, emotions, speech, machine learning, artificial neural networks

### Introduction

One subfield of artificial intelligence is machine learning. By utilizing some methods, this discipline is used to forecast outcomes more precisely. The goal of Speech Emotion Recognition, or SER for short, is to extract human emotions from speech. Given that speech frequently conveys underlying emotion through pitch and tone, this is a benefit. In order to comprehend human emotion, animals like dogs and horses also use this phenomenon. Because emotions are arbitrary and audio annotation is difficult, SER is difficult. Using MLP Classifier, a model has been created to detect emotions in human speech.

This paper produces the results of human emotions by speech recognition using MLP Classifier. The work has been carried over RAVDESS data set which contains 7356 files of 24 actors. The emotions from human speech sound files are recognized as neutral, happy, sad, calm, angry, fearful, disgust and surprised. It is implemented by using python libraries like librosa, sklearn and JupyterLab open source software. The aim is to build a model using an MLP Classifier for recognizing the emotions from the human speeches.

### Related work

This section elaborates the literature survey of the MLP classifier discussed in the research papers. The aim of the artificial neural networks is to optimize the number of hidden layers. Some research works states that some neural network parameters which are to be considered are designed but they are not optimal[3][10]. Before learning, the traditional algorithms fixes the architecture of artificial neural network [4][9]. Some of the studies proposes constructive learning [5]-[6]. In constructive learning, architecture has been designed with minimum hidden layers. Initially hidden layers are designed with minimum number of neurons[7][11][12][20]. T.B Ludermir et. al. [14] designed ANN with an approach with few connections in one hidden layer and training with different optimized hybrid algorithms. In some research work, to optimize the model, only one decision variable has been designed for the hidden layers[1] and in some other research work taken into account the hidden node optimization in the layers[2]. To train these two models, back propagation algorithms are used.

### Methodology

The MLP classifier has number of applications like regression and classification in all the fields.

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## REDUCTION OF DMS COMPLEXITY FOR DRIVER OPTIMIZATION BY USING DEEP LEARNING TECHNIQUES

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### Abstract

The driver monitoring system (DMS), commonly referred to as the driver attention monitor, is crucial to the operation of the safety systems in vehicles. In DMS, the system recognises the driver's actions, such as driving when fatigued or failing to pay enough attention to prevent collisions. The technology alerts the driver to help prevent errors made while driving. DMS deployment requires a system that operates in real time with no delays. Due to the complexity of network implementation, the current DMS faces numerous implementation issues. We provide an optimization approach that makes use of camera pictures to track the activities of the driver in order to lessen the complexity of the DMS for real-time implementation. From the input camera images, we extract the driver's state information from the region of interest (ROI).

**Keywords:** Deep neural network (DNN), Key point Detection, 3D Transformation, camera calibration.

### Introduction

Road accidents have significantly grown over the last few years, causing serious health problems and even fatalities [1]. Drivers are subject to a number of risk variables, which ultimately lead to collisions of various severity levels [3]. Professional drivers, weariness, large vehicle types, overloads, and topography have all been highlighted as risk factors. By offering technical solutions to these uncovered risk factors, accidents may be reduced to some extent. Technology improvements have led to a widespread use of many smart and intelligent strategies in the transportation sector [4]. These methods aid in distributing parking spaces, streamlining traffic, etc. These methods aid in lowering driver irritability, irresponsibility, etc. Various driver monitoring systems with a driver eye movement, behavior, fatigue etc focus are currently available. The basic idea behind the project "Drivers eye" is real time monitoring of the driver's eye and facial features using a camera. Then these images are processed to find the drivers behavioral conditions like distraction, drowsiness, fatigue etc. The signals from the vehicle parts like accelerator, brake, steering etc. are also recorded and both these data are simultaneously processed to find out whether the driver is distracted. If the driver is distracted, the alarm system which is placed inside the vehicle will warn the driver. This will help the driver to recover from distracted state to the normal driving state. The majority of driver distractions are caused due the usage of smartphone, social networking activities etc. while driving [7]. The proposed system can reduce the driver accidents that are caused due to such social activities. The proposed model uses Viola Jones Algorithm for Face analysis and combined with other machine learning algorithms for evaluation of both In-Vehicular and Face data evaluation. The open data datasets were used for training both In-Vehicular and Face Data.

### Related Work

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Road accidents have significantly grown over the last few years, causing serious health problems and even fatalities [1]. Drivers are subject to a number of risk variables, which ultimately lead to collisions of various severity levels [3]. Professional drivers, weariness, large vehicle types, overloads, and topography have all been highlighted as risk factors. By offering technical solutions to these uncovered risk factors, accidents may be reduced to some extent. Technology improvements have led to a widespread use of many smart and intelligent strategies in the transportation sector [4]. These methods aid in distributing parking spaces, streamlining traffic, etc. These methods aid in lowering driver irritability, irresponsibility, etc. Various driver monitoring systems with a driver eye movement, behavior, fatigue etc focus are currently available. The basic idea behind the project "Drivers eye" is real time monitoring of the driver's eye and facial features using a camera. Then these images are processed to find the drivers behavioral conditions like distraction, drowsiness, fatigue etc. The signals from the vehicle parts like accelerator, brake, steering etc. are also recorded and both these data are simultaneously processed to find out whether the driver is distracted. If the driver is distracted, the alarm system which is placed inside the vehicle will warn the driver. This will help the driver to recover from distracted state to the normal driving state. The majority of driver distractions are caused due the usage of smartphone, social networking activities etc. while driving [7]. The proposed system can reduce the driver accidents that are caused due to such social activities. The proposed model uses Viola Jones Algorithm for Face analysis and combined with other machine learning algorithms for evaluation of both In-Vehicular and Face data evaluation. The open data datasets were used for training both In-Vehicular and Face Data.

### Related Work

## REDUCTION OF DMS COMPLEXITY FOR DRIVER OPTIMIZATION BY USING DEEP LEARNING TECHNIQUES

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Narayanreddy College Of Engineering And Research, Hyderabad.

### Abstract

The driver monitoring system (DMS), commonly referred to as the driver attention monitor, is crucial to the operation of the safety systems in vehicles. In DMS, the system recognises the driver's actions, such as driving when fatigued or failing to pay enough attention to prevent collisions. The technology alerts the driver to help prevent errors made while driving. DMS deployment requires a system that operates in real time with no delays. Due to the complexity of network implementation, the current DMS faces numerous implementation issues. We provide an optimization approach that makes use of camera pictures to track the activities of the driver in order to lessen the complexity of the DMS for real-time implementation. From the input camera images, we extract the driver's state information from the region of interest (ROI).

**Keywords:** Deep neural network (DNN), Key point Detection, 3D Transformation, camera calibration.

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### Related Work

## AN ASSESSMENT OF IOT APPLICATIONS PROTECTION PROBLEMS AND SOLUTIONS

<sup>1</sup>S. Varalakshmi, <sup>2</sup>P. Venkateswar Rao, <sup>3</sup>G.Pavani, <sup>4</sup>V.Kumar

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### Abstract

The Internet of Things (IoT) has made life easier for people because they can access all connected gadgets remotely while stationary. IoT refers to a network of integrated machines, objects, and gadgets that each have a unique identifier. IoT refers to everything and anything that is network-connected. Global connectivity and the flow of data have had a significant impact on home applications, company operations, the health care system, military capabilities, and international trade. In this digital age, protecting against malicious activities that try to steal or corrupt data or disrupt an organization's systems through unauthorized access is the top priority for cyber security. To secure the IoT network using machine learning and Deep learning, Neural Networks, Block-Chain methods, numerous novel models and methods are being presented. In this survey paper, we reconnoiter on various IoT applications, its growth, specification, and the security challenge of layered structure. We analyze the present's challenges, issues that emerge in IoT network and provide a comparative analysis for the available solutions. We have also proposed a novel three-tier framework to control unauthorized access and identify suspicious internal activities in the private IoT network. This present survey is beneficial for industry and academia to categorize the challenges and issues in the current IoT security models and generate new dimensions of developments in it with advanced technologies.

### INTRODUCTION TO IOT AND ITS EVOLUTION

In recent decades, the computing industry and related communications technologies have seen a revolt. For all daily tasks, a portable digital system is the only option; using connected digital equipment has evolved into an opulent instrument for today's prosperous market. In this technologically advanced day, an easy and comfortable living is essential. Everything from food to fashion, quick cash to fund transfers, a lexicon to gadgets is available with just one click. Internet of Things is the answer to this problem (IoT). IoT refers to a network of connected computers, machines, objects, animals, or people. Possess the ability to communicate data over networks and are given unique identifiers [1]. As the population grows, the number of connected devices in the network is rising quickly. Approximately 7.9 billion and the number of connected devices is almost over 50 billion people live on Earth now. At this rate the IoT industry will play major role in changing the graphs of some of the current industries. IoT will conquer the automobile and the enterprise industry [1]. Some of the automobile companies like Tesla have already started to integrate IoT with automobile in a very huge scale. We can see a verysteep growth in the IoT in the coming years.

The reason for the same would be: -

- Decrease in the manufacturing cost of the sensors due to a huge demand.
- Decrease in the cost of data connections due to cloud storage solutions.
- Increase in the smart phone / tablet usage.

### CONTRIBUTION

Our present survey focuses on various IoT applications and the threats with its effects. Main aim of the study to provide a view on available models, techniques, framework proposed using latest techniques. Our main contributions are as follows.

Highlighting security issues: We provide the list of attacks prone to each application of IoT and also discuss the effects caused by each.

## AN ASSESSMENT OF IOT APPLICATIONS PROTECTION PROBLEMS AND SOLUTIONS

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## IDENTIFICATION AND DETECTION OF FAKE OSN PROFILES BASED ON ANN TECHNOLOGY

<sup>1</sup>Dr.P.Satish Reddy, <sup>2</sup>Dharma, <sup>3</sup>N.Vasundhara, <sup>4</sup>R.Shilpa

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### ABSTRACT

Applied sciences are now expanding quickly. The use of smart phones is growing. Everybody now uses online social networks, which make it simpler to make new friends, stay in touch with old ones, and follow one's passions. However, there are some negative aspects to the growth of internet networking, such as people fabricating profiles. We can determine the authenticity of an account's information by using neural networks. To train an artificial neural network (ANN) algorithm that will be employed whenever fresh test data is provided to distinguish between real and fake user accounts, all previous users' fraudulent and a actual account data will be used.

### 1. INTRODUCTION

Tens of millions of people use the internet for long-distance communication, consuming trillions of minutes of their time in the process. OSN administrations include social networking platforms like Facebook and MySpace, understanding-driven platforms like Twitter and Google Buzz, and social networking platforms used to introduce frameworks like Flickr. Social Networking Sites Online (OSN). Contrary to popular assumption, ensuring OSN privacy and enhancing security is a difficult task with a significant bottleneck. People disclose a staggering amount of information about their personal lives on social media platforms (Sns). We are great targets for special attacks because to our entire or partial exposure to the general public, including the most horrible of them all, ID burglary. It is possible to commit data fraud when an individual takes advantage of a character's abilities for their own personal gain or gain of some other kind. It has been a major problem in the past several years because it has affected a large number of people around the world. Victims of ID theft may be subjected to a wide range of consequences, including loss of time and money, placement in a correctional facility, destruction of their public image, and impairment to their relationships with partners, friends, and family. As of right moment, the vast majority of SNs no longer checks the duties of common users and have privacy and security techniques that are completely insecure. Many of SN's programmers default to a low level of privacy, making it an ideal platform for misrepresentation and abuse. For genuine assailants equivalent to innocents, person-to-person communication contributions have worked in conjunction with data fraud and impersonation attacks. To add insult to injury, customers are expected to have a working knowledge of social networking sites in order to create a profile. Simply keeping an eye on what customers post online might lead to catastrophic failures, and that's before we even consider the possibility that these bills have been compromised. Web-based companies' profiles might be static or dynamic, depending on the company's policy. Static information refers to the specifics that an individual can supply at the time of profile creation, whereas dynamic information refers to the location as the key portion that is specified with the framework's guide inside the company. Segment components and advantages of a person are incorporated into static data, while runtime propensities and region for an individual are stored in dynamic data. Static and dynamic data are used extensively in momentum studies. It's not suited to a large number of informal groups, where just a few static profiles can be observed and dynamic profiles are usually not evident to the organisation. More than one approach has been presented by exceptional experts who are trying to figure out the false characters and harmful content material in web-based informal communities. There were positives and negatives to every interaction. Long-distance interpersonal communication difficulties, such as security, web-based agony, abuse, and savaging, as well as a number of other issues, are addressed. Many of these examples include the use of false information in long-distance interpersonal contact profiles. A misleading profile is a profile that isn't explicitly stated, such as a profile of a person

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## **DATA SECURITY FOR REGISTERED PROPERTY AND TRANSACTIONS USING BLOCK CHAIN TECHNOLOGY**

<sup>1</sup>CH.Sangeetha, <sup>2</sup>S.Sridhar Reddy, <sup>3</sup>T.Sharada, <sup>4</sup>Thummala Divya

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### **ABSTRACT**

Nowadays, a lot of business is done every day including things like land. Traditional database systems serve as the foundation of the vast majority of these transactions. The database is susceptible because it is a centralised system. Since the data in database systems is changeable, the records can be changed. A better option might be to construct a property register utilising a block chain technology. The block chain contains immutable data. A block chain transaction cannot be changed once it has occurred. The immutability of a block chain network increases the security of the transactions. Without the assistance of a reliable third party, a block chain ensures the security and fidelity of a data record.

**Key Words:** Block chain, Property, Immutable, Secure and Transaction.

### **1. INTRODUCTION**

"Property registry and transaction utilising Block chain" is the title of this paper. Property registration requires a variety of information, including ownership, property specifics, property size, etc. Property transactions are now carried out utilising the conventional database techniques. The fact that the data can be changed makes traditional database systems insecure as well. It leads to fraudulent activity, illicit activities, etc.[4]. Given that block chain networks' records are immutable; they are the ideal solution to this issue. Unlike databases where the data can be changed or destroyed, we can only read and write the data. There can be no involvement of dependable third parties because the block chain is a decentralised, peer-to-peer network. This project's goal is to provide a platform where anyone may use block chain technology to conduct property-related transactions.

Present paper is intended to explore the potential that the block chain system has in the area of property transactions. It is intended to explore the immutability, security of the records and how a block chain system performs in this field. There are many approaches have been made to automate the property registry data maintenance in order to eliminate the process of keeping bookish records or on paper. Initially databases are



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## COST-EFFECTIVE AND SUSTAINABLE SYSTEM FOR FACULTY DAILY REPORT GENERATION SYSTEM IN COLLEGE PORTAL

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Each achievement and document management in educational institutions today is done by hand. Documents related to these manually carried out operations are kept on hard drives and ledgers. There is no proper reporting method for jobs or successes; they are all preserved in files, hard drives, or paper papers. Data loss can happen, manual processes take a long time to complete, and they might hinder actual work. This process needs to be automated due to the network's rapid growth in order to make manual work easier. With all information routed through a single portal, this may handle all faculty events extremely smoothly while also considerably increasing the college management's economic growth. The manual management of faculty records presents management with a number of difficulties that cause them to lose a lot of time in binding the data together. So to overcome these types of problems, our portal contains different modules like teacher information, documents, achievements, and report generation. All faculty data is kept in this portal, one can view all their achievements and generate or print their reports. So each document is kept in the database and there is no data loss and access to the document is very quick.

**Key Words :** Organization, manual management, Network

### 1. INTRODUCTION

Although some claim that managing documents is difficult, we comprehend the strain and effort the organisation goes through to keep them up to date. Therefore, we made an effort to create a comprehensive solution called "Faculty Report Generation System" the gateway location where instructors can maintain their accomplishments and documentation. Our system aims to create a system that is both affordable and sustainable. It is the core of the procedure and most suited to the user's analysis.

The analysis is the examination of the many tasks carried out by the system, including relationship maintenance and activities like adding, updating, removing, reading, and searching for information. Data about the files, decision-making processes, and transactions handled by the current system was gathered during analysis. With the use of a username and password, one may access the System. It is accessible by an administrator and even by the faculty. The data can be retrieved easily with a single click. The data is organized in a well systematic fashion. If any of the faculty loses their data, it can be easily retrieved from the database. Here the data will be stored in the database so that the data will be stored for a long period of time. It can be accessed by any person who has permission to do so.



## COST-EFFECTIVE AND SUSTAINABLE SYSTEM FOR FACULTY DAILY REPORT GENERATION SYSTEM IN COLLEGE PORTAL

<sup>1</sup>S.Varalakshmi, <sup>2</sup>R.Mrudula, <sup>3</sup>G.Pavani, <sup>4</sup>Vennu Shyam Kumar  
<sup>1,2,3</sup> Assistant Professor, <sup>4</sup>UG Student, <sup>1,2,3,4</sup>Department of Computer science and Engineering, Kasireddy  
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## AN ANALYTICAL STUDY ON MOHSIN HAMID'S EXIT WEST REFOULEMENT

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The act of compelling refugees or asylum seekers to return to a nation or region where they are likely to experience persecution is known as refoulement. Exit West by Mohsin Hamid (2017) explores a number of issues, including forced migration, violence, forced displacement, living as a refugee, settlement, resettlement, and rehabilitation. It is centered on the love story of Nadia and Saeed, who are refugees and must deal with challenges in order to begin a new life in their new home. This essay's goal is to discuss the refoulement of refugees as they attempt to establish themselves in their new surroundings after being uprooted from their original homes. In the chosen book and the current research, the idea of refoulement has been discussed is about the refugee's situation in crisis throughout the refoulement.

**Key Words:** atrocities, refugees, refoulement, landscape, violence, etc.

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The French word refoulement, which means "turning away, rejection," is the source of the word. Refoulement is when a refugee or asylum seeker is made to return to a place where they are likely to experience persecution (Merriam-Webster). In accordance with American law, a refugee is someone who has a "well-founded fear of persecution." They have a right to sanctuary or political refuge in their native country. Sending them home would be a diplomatic offence known as refoulement, which would include putting them in danger against their will (The New York Times). However, according to OCHA Services, the Danish Government mails letters to Syrian child refugees under the age of 15 asking them to find new accommodations.

A 12-year-old girl born in Syria who has spent the past eight years of her life living and studying in Denmark received a letter addressed to her personally from the Danish Immigration Service saying, "If you do not leave voluntarily, you can be forcibly sent to Syria." (Qtd. "Denmark") In this way, refoulement is forcing the refugees to vacate their new homes to either return home or leave somewhere else.

### Refoulement in Fiction

Amitav Ghosh's *The Hungry Tide* (2004) illustrates the refoulement scenario of an imaginary island at Sunderban delta. Even Morichjhappi is full of dangerous areas with tigers and crocodiles, the refugees take shelter there. After confirming their real identity that they are refugees, the natives, administration, and government machinery force them to vacate that place. There happened genocide and maximum refugee men are murdered and women and children are kidnapped. Lala Kanshi Ram in Chaman Nahal's *Azadi* (1975) reached Kingsway refugee camp in Delhi. Lala Kanshi Ram has inquired about his entry into Delhi even though the officer is already aware of the refugee people. The officer wants Lala not to come to Delhi. Harit Mandol also faces similar problems in Sunil Gangopadhyay's *Purbo Paschimo (East-West)* 1988. Harit Mandol is among the East Bengali refugees after the partition of India in 1947. He is forced to leave his new homeland after his immigration to West Bengal. Consequently, the asylum seekers are not safe in the new location. Here, they are also forced to migrate or vacate the new destination.

The present paper has focused on the concept of 'Refoulement' in Mohsin Hamid's *Exit West* and it describes that the author is a Pakistani novelist, writer, and massive consultant along with one of the most gifted and audacious authors of his contemporary world. In *Exit West*, Hamid explains the



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**Keywords:** Silver nanoparticle synthesis, green synthesis, Senna Alata, Senna Hirsuta, Antibacterial activity.

### Introduction

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In particular, Ag NPs have excellent antimicrobial activity against multiple microorganisms known to be responsible for multiple infectious diseases. Because of this, they were used successfully in various medical products, such as catheter coating materials for cerebrospinal fluid drainage (Bayston et al., 2007; Galiano et al., 2008), contact lenses (Weisbarth et al., 2007), and other medical devices. They were also used in bone cement (Alt et al., 2004), surgical masks, impregnated silk fabrics, nanogels, nano-lotions (Furno et al., 2004; Ipet et al., 2006; Leaper, 2006; Li et al., 2006), wound dressings, and so on (Atiyeh et al., 2007). Indeed, most of the products developed on Ag-based have been commercialized and approved by global regulatory bodies.

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# Analysis of the Tadpole Graph $T_{m,n}$ Cardinality of Hop Dominance Number

<sup>1</sup>K Sridhar, <sup>2</sup>T Sailaja, <sup>3</sup>Renuka Upoji, <sup>4</sup>Aithagoni Navya Sri

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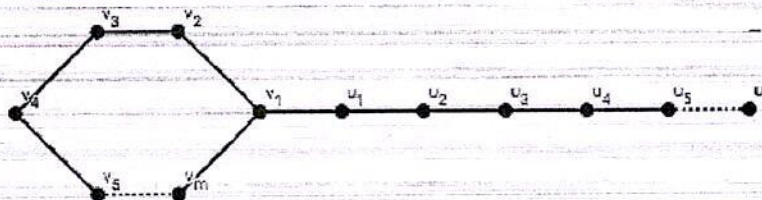
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Make  $T_{m,n}$  a tadpole graph. If there is an  $u$  in  $S_h$  such that  $d(u, v) = 2$  for all  $v$  in  $V - S_h$ , then the set  $S_h \subseteq V(T_{m,n})$  is a hop dominating set of  $T_{m,n}$ . The hop domination number of  $G$  is the minimal cardinality of a hop dominating set of  $G$  and is represented by the symbol  $h(T_{m,n})$ . In this essay, we spoke about the tadpole graph's hop dominance number.

**Keywords:** hop-domination, hop-domination number, Tadpole graph, neighbourhood.

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## Analysis of the Tadpole Graph $T_{m,n}$ Cardinality of Hop Dominance Number

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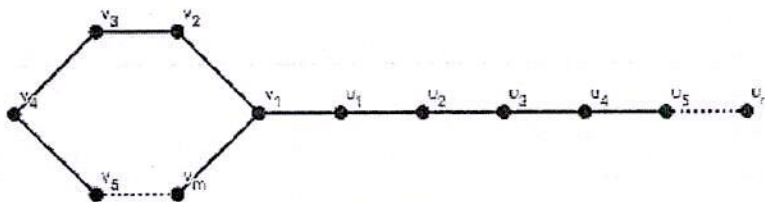
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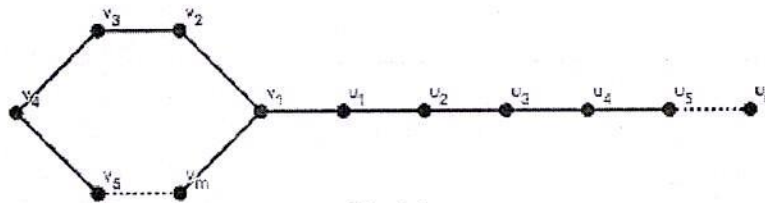
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Industries and individuals outsource database to realize convenient and low-cost applications and services. In order to provide sufficient functionality for SQL queries, many secure database schemes have been proposed. However, such schemes are vulnerable to privacy leakage to cloud server. The main reason is that database is hosted and processed in cloud server, which is beyond the control of data owners. For the numerical range query (“>”, “<”, etc.), those schemes cannot provide sufficient privacy protection against practical challenges, e.g., privacy leakage of statistical properties, access pattern. Furthermore, increased number of queries will inevitably leak more information to the cloud server. In our paper, we propose a multi-cloud architecture for secure database, with a series of intersection protocols that provide privacy preservation to various numeric-related range queries. Security analysis shows that privacy of numerical information is strongly protected against cloud providers in our proposed scheme.

**Keywords:** cloud server, privacy, SQL Queries,

## INTRODUCTION

### Introduction to Network Security

Managing security means understanding the risks and deciding how much risk is acceptable. Different levels of security are appropriate for different organizations. No network is 100 percent secure, so don't aim for that level of protection. If you try to stay up-to-date on every new threat and every virus, you'll soon be a quivering ball of anxiety and stress. Look for the major vulnerabilities that you can address with your existing resources.

We all know the numerous advantages of computer networks and the Internet. Connecting your network to the Internet provides access to an enormous amount of information and allows you to share information on an incredible scale. However, the communal nature of the Internet, which creates so many benefits, also offers malicious users easy access to numerous targets. The Internet is only as secure as the networks it connects, so we all have a responsibility to ensure the safety of our networks.

### Why Is Network Security Important?

The good neighbor policy. Your mistakes can be someone else's headaches. If your network is insecure and someone takes control of one of your computers, they can use that machine to launch denial of service attacks on innocent third parties. They can also flood the Web with spam.

Patron privacy. Obviously, patron records are of paramount importance. Trust between the library and its clients can be irreparably harmed if these records are compromised.

Money and time. Tracking down a virus or a worm and eliminating it from your network is frustrating and time-consuming. You often have to rebuild your machines from the ground up, re-installing the operating system and software and restoring data from backup tapes. Lax security can lead to weeks of wasted time spent patching your network and fixing the wreckage.

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The growing industry of cloud has provide a service paradigm of storage/computation outsourcing helps to reduce users' burden of IT infrastructure maintenance, and reduce the cost for both the enterprises and individual user]. However, due to the privacy concerns that the cloud service provider is assumed semi-trust (honest-but-curious.), it becomes a critical issue to put sensitive service into the cloud, so encryption or obfuscation are needed before outsourcing sensitive data - such as database system - to cloud

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### Abstract

The reactions of 5-substituted-2-Amino benzenethiols with hetero chalcones (3) were conducted in dry toluene containing catalytic amounts of piperidine. The products, 8-substituted-2,5-dihydro-2-(2-furanyl)-4-(2-thienyl)-1,5-benzothiazepines (5), and hetero chalcones (3), were produced by the pipe (1). The structures were constructed using data from mass spectrometers, IR, <sup>1</sup>HNMR, and elemental (C, H, and N) analyses. The antibacterial properties of compounds (3) and (5) were examined against various bacterial agents.

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The hetero chalcone 3 was prepared by reacting furan-2-carbaldehyde 1 and 1-thiophen-2-yl-ethanone 2 in EtOH (50mL) and piperidine (1 mL) was added refluxed. After the completion of reaction, which was monitored by TLC, ethanol was distilled off and residue was poured on ice water (100mL). It was kept overnight in the refrigerator. The resulting solid was collected by filtration, washed with distilled water and crystallized from methanol to give corresponding chalcone 3.

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1, 5-benzothiazepines 5 were prepared by reacting hetero chalcones 3 and freshly prepared 5-substituted-2-acetylthiophene 4 in dry toluene containing piperidine. The reaction are known<sup>25-29</sup> to be initiated by nucleophilic attack of the sulphydryl electrons, whose nucleophilicity is increased in the basic medium,<sup>30</sup> on the  $\beta$ -carbon atom of the 2-propenone to give the cyclized product. Through the formation of Michael adduct intermediate, in a single step. The structures of the final products were ascertained by microanalysis for C, H, N and spectral studies comprising IR, <sup>1</sup>H NMR and MS all compounds were screened antibacterial activities. In the IR spectrum of 3 Strong absorptions for C=O and vinylic C=C were observed at 1646 and 1625  $\text{cm}^{-1}$ , respectively. The position of the vinylic C=C appearing at a frequency lower than for an isolated double bond may be due to C=C

## Overcoming the AIED's recommendations, difficulties and the effects of employing AI in education

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### Abstract

By solving the key difficulties in education today, artificial intelligence (AI) has the ability to reform and revolutionize the educational system. AI has the potential to be a useful teaching tool for both students and teachers. However, it is essential that the difficulties of employing AI in education (AIE) are assessed before adopting it in education given the digital divide and the hazards linked with technology. Additionally, efforts should be made to harness the human component of AI, particularly when it is used in teaching. As a result, the goal of this study is to investigate, examine, and evaluate the many AI technologies used in education and determine how well they facilitate learning and teaching. It will also cover the difficulties and dangers of implementing IA in education. This paper will give recommendations to overcome the challenges of AIED and reflect on the implications of using AI in education.

**Keywords:** Artificial Intelligence in Education, Technology, Challenges and Prospects.

### Introduction:

McCarthy coined the phrase "artificial intelligence" for the first time in 1956. Artificial intelligence is defined by Baker and Smith (2019) as machines that carry out mental functions normally performed by humans. Machine learning is not the same as artificial intelligence (AI), which is a field of computer science that builds computers that mimic or boost human intelligence. Although the phrases artificial intelligence and machine learning are sometimes used interchangeably, they are actually two distinct concepts. Machine learning, data mining, language processing, neural networks, and other technologies and methodologies are all included in the field of artificial intelligence. As a result, we can see that machine learning is a type of AI where computer systems automatically pick up new skills and develop existing ones.

"Artificial intelligence in education opens new opportunities, potentials and challenges in educational practices" opines Ouyang & Jiao (2021). Artificial intelligence and adaptive learning are the two most prominent developments in educational technology. Educators all over the world are exploring the pedagogical potential of AI in higher education and AI is undoubtedly the future of higher education. AI can provide humongous support to both teachers and learners by facilitating effective teaching and learning. Though Artificial intelligence is considered to be the future of education, teachers are not aware of its scope and potential in education. Also, despite the advantages that AI provides to teaching and learning, there is a huge risk that comes along with the application of AI in higher education. In this backdrop, this research paper intends to discuss the various AI tools used in education, analyse the potential of artificial intelligence applications in education. This paper will also discuss the challenges associated with the use of AI in education and give recommendations to overcome these challenges.

### AI Tools used in Education Game-Based Language Learning

Educational games make learning interesting and fun for students. AI has great potential in aiding language learning. Voice-interactive systems can play the role of a teacher as well as a conversational partner to provide umpteen opportunities to learners to practice conversation and give immediate feedback to the learner regarding the quality of speech. It can also be used for pronunciation and intonation training for non-native speakers of a language. However, the major

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## Demonstrating and learning the development of web app "the beanstalk" using data analysis method

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### Abstract

The purpose of this essay is to present the lessons discovered while creating the web application "The Beanstalk." Students may utilize The Beanstalk, a tool that develops together with them, to get ready for any test. The web application evaluates the student's performance in each test they take and generates the next set of questions based on factors like how long it takes to answer each question, how many hints are needed, whether the answer is correct or not, etc. This helps the student gain mastery over the domains they want to. To do this, The Beanstalk makes use of a vast and extensive data collection.

**Keywords:** Analyze, tests, evolving, performance, comprehensive, data set, Beanstalk, development, web-app, generate question paper, mastery, questions.

### Introduction

Students today use the internet and all the tools it offers to advance their learning and do better on tests. However, individuals could become bogged down in the limitless knowledge the internet offers and are continually switching tabs in search of that one nugget of knowledge that may or may not be useful to them. They may also choose from a variety of websites that offer learning resources like question banks and practice examinations. Here comes the beanstalk, as it offers a single answer for all these issues, the institution may not be able to give the students the resources they "should" have. The beanstalk includes a thorough and rich set of question banks, as well as a test engine that customizes itself to each student. Educational institutions can incorporate The Beanstalk in their eco system providing their students the aid they deserve.

### Technologies Utilized

For the development of the web-app, some knowledge about full stack development was required. The Beanstalk is built upon the Flask web framework, the main website was built using HTML, CSS, JavaScript. For the database, responsible for the comprehensive data set, SQLite was used.

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The highlight of the beanstalk is its test system, which adapts to each student individually by analyzing the way they attempt the tests. In the current iteration of the algorithm, the system analyses the time taken, number of hints taken and whether the answer is correct or not for individual questions. To generate the new question paper certain labels were made

- MO (move on)
- RSQ (Repeat Same Question)
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The questions have different attributes to which these labels are given according to the recorded observations by the students' latest attempt at the question paper. Then the labels for a question are combined into a final verdict for that question with the same labels (to maintain simplicity) and with that we have a final verdict for each question from the previous question paper.

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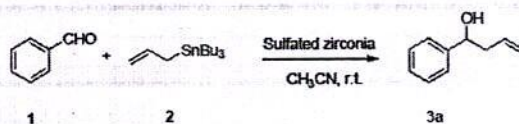
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### INTRODUCTION

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Recently, the use of heterogeneous solid acid catalysts has received tremendous interest in different areas of organic synthesis.<sup>25-27</sup> The heterogenous solid acids are especially advantageous over conventional homogeneous acid catalysts as they can be easily recovered from the reaction mixture by simple filtration and can be reused after activation or without activation, thereby making the process economically more viable. Of several solid acids, sulfated zirconia shows excellent catalytic activity for various organic transformations.<sup>28-36</sup> The catalytic features of sulfated zirconia are different from the conventional acid catalysts. However, there are no reports on the use of sulfated zirconia for the synthesis of homoallylic alcohols.

Following our interest in developing new synthetic methodologies using solid acids, we herein report a simple and efficient protocol for the allylation of aldehydes with allyltributylstannane using a catalytic amount of sulfated zirconia at room temperature.



# Analysis on using a Super Acid Catalyst, Homoallylic Alcohols are Synthesised. Sodium Zirconia

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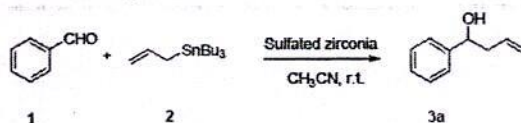
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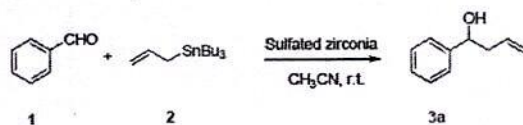
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# CONCEPTUAL FRAMEWORK ANALYSIS on ANTECEDENTS OF EMPLOYEE ENGAGEMENT

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## ABSTRACT

Employee engagement refers to workplace method designed to improve an employee's feelings and emotional attachment to the company, their job duties and position within the company, their fellow employees, and the company culture. To make or maintain company's sustainability, leaders of companies will work hard to engage their employees using various practices such as fair pay & benefits, effective co- operation, ethical behavior, job satisfaction, career development etc. The purpose of this study is to understand the importance and the necessity of the employee engagement which is seen as a driving force for not only in increasing employee commitment but also enhancing business and individual performance. Through the literature reviewed it is observed that there are some common factors that are constantly affecting the employee engagement such as compensation, recognition, leadership, training & development, work environment, career opportunities and HR practices. On the other hand there are new and contemporary variables that also affect employee engagement such as CSR activities, whereas HR analyt\s and employee motivation are acting as moderating variables.

**Key Words:** Employee engagement, compensation, performance, Leadership, recognition.

## INTRODUCTION

Over the years, it's been one of the toughest challenges faced by CEO, HR, and corporate leaders in many companies. All organizations recognize the importance of engaging and motivating their employees. This has become more important over time. The organization was to ensure that when employees logged in each day, they logged in not just physically both mentally and emotionally. In short, organizations need to make sure that employees are genuinely engaged. Employee Engagement is a key driver of today's business. It actually affects employee morale, productivity and reason to stay with the company. Organizations use dedicated employees as a tool of strategic ability. Engaged employees are aware of business conditions and collaborate with colleagues to improve performance within the workplace for the benefit of the organization and themselves. It is a positive attitude towards the organization and its employee's value. Dedicated employees work with complete commitment and enthusiasm.

## OBJECTIVE OF THE STUDY

- To identify the factors that influence employee engagement



## CONCEPTUAL FRAMEWORK ANALYSIS on ANTECEDENTS OF EMPLOYEE ENGAGEMENT

<sup>1</sup>Dr.J.Venogopal, <sup>2</sup>S.Lakshma Reddy, <sup>3</sup>M.Sandeep, <sup>4</sup>A.Jyothiswaroopa  
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Narayanreddy College Of Engineering And Research, Hyderabad.

### ABSTRACT

Employee engagement refers to workplace method designed to improve an employee's feelings and emotional attachment to the company, their job duties and position within the company, their fellow employees, and the company culture. To make or maintain company's sustainability, leaders of companies will work hard to engage their employees using various practices such as fair pay & benefits, effective co- operation, ethical behavior, job satisfaction, career development etc. The purpose of this study is to understand the importance and the necessity of the employee engagement which is seen as a driving force for not only in increasing employee commitment but also enhancing business and individual performance. Through the literature reviewed it is observed that there are some common factors that are constantly affecting the employee engagement such as compensation, recognition, leadership, training & development, work environment, career opportunities and HR practices. On the other hand there are new and contemporary variables that also affect employee engagement such as CSR activities, whereas HR analyt\s and employee motivation are acting as moderating variables.

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## A REPORT OF THE NATURALS SPA AND SALOON'S SERVICE QUALITY AND CUSTOMER SATISFACTION

<sup>1</sup>S.Jayadeva Reddy, <sup>2</sup>G.Rishitha, <sup>3</sup>P.Srikala, <sup>4</sup>G.Sreeja

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### ABSTRACT

The satisfaction feelings are an important factor in the process of acquisition and retention of customers. Investigation and monitoring of the level of their satisfaction become essential process of marketing research carried out by companies operating in almost all sectors of the economy. It is pointing out the shortcomings, weaknesses offered goods, services or their quality. Compliance of consumer's expectations and demands, recognition of their unconscious needs, is not currently a priority, but it is standard. Aim. The aim of the study was to know how often customer's visits saloon, treatments do they prefer and what is their satisfying level. The primary data is collected through a structured questionnaire. The investigation was performed via the Internet among a group of nearly 103 respondents. The results shows that that customer visits several times a year mostly for hair services, facials, for skin care treatment and they feel satisfied and relaxed visit to the saloon. It is found that most of the customers heard about the saloon through social media so the naturals unisex saloon and spa should focus mostly on advertisements to attract more customers.

**Key Words:** Customer satisfaction, Beauty parlors and SPA, Customer preference, Advertisements, Skin and hair services

### INTRODUCTION

The lifestyles of the peoples now a days changed rapidly over the past few years, people are realizing the importance of good health and presentation and thus becoming more concerned about their health and beauty. Nowadays in India beauty parlors and salons have become the stress-buster hubs of the 21st century Indians. People fulfill their wish of good-looking by frequently visiting the mind and body renewing spa and salons. Beauty salon is fast growing in line with the economic growth and changes in modern life-style. Increase in the knowledge of grooming made increase in technology, and sanitation levels, the contribution of salons and beauty parlors in people's life has also increased.

Spa centers were known from the roman thermos and are more popular. The International Spa Association defined Spas as entities devoted to enhancing overall well being through a variety of professional services that encourage the renewal of mind, body and Spirit. The spa industry has grown at a phenomenal rate in the past ten years. The growth of health food, gyms and the investment in leisure facilities proves that consumers are looking for more than relaxation during a break or holiday; this unsurprising given time is so precious to contemporary consumers.

The spa market is one of the fastest growing leisure sectors, where societal trends and aspirations find instant reflection in the developments on both the demand and supply sides. The market is very fragmented, each segment catering for different customer needs, which continuously change in line with social and lifestyle changes.

### Naturals Unisex Salon and Spa

Naturals were established a decade ago, with a dream to change not just the way people looked but to add sample positively in their attitude to life. Groom India Salon & Spa Private Limited is the registered name for the chain of Spa & Salons across the country known as **Naturals Unisex Salon & spa**. Naturals, is synonymous today with beauty care and styling in India. Naturals is acknowledged as the most happening chain of beauty care centers in India. On the sheer strength of performance and positive response from patrons, Striving to revolutionize the grooming industry in every aspect, Naturals has established an academy to train professionals who want to take up a successful career in the wondrous world of beauty. Naturals has

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## A REVIEW ON THE CONTRIBUTING FACTORS TO EMPLOYEE ATTRIBUTION

<sup>1</sup>R.Ravinder, <sup>2</sup>B.Sangeetha Kumari, <sup>3</sup>T.Swapna, <sup>4</sup>U.Rishi Kumar

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### ABSTRACT

Employee attrition is a problem faced by all companies irrespective of the industry they belong to. The rate of attrition is increasing day by day. Attrition incurs both tangible and intangible costs to the company. In this study, we made an attempt to find the factors which motivates an employee to leave the organization. Primary data is used to conduct this study. The primary data was collected through a well structured questionnaire. The tool used for analyzing and interpreting the responses obtained from questionnaire was MS Excel. This study helps the management of the organizations to understand the factors that push employees out of the organization so that they can design effective HR policies which pull employees towards the organization.

**Keywords:** Employee attrition, HR policies, Pivot tables, Pivot charts, MS Excel

### INTRODUCTION:

Decrease in the number of employees in an organisation due to retirement, resignation, illness and death is called attrition. There are two types of attrition. They are voluntary attrition and involuntary attrition. Voluntary attrition is of two types, they are functional attrition and dysfunctional attrition. Exit of employees performing well is called functional attrition and the exit of employees who are not performing well is called dysfunctional attrition. The attrition caused by dismissals, serious illness and retirement is called involuntary attrition. (augustin et al., 2012). When an employee who is performing well leaves an organisation, it is a big loss to the organisation as it causes both tangible and intangible costs to the organisation. Tangible costs are costs incurred to recruit a new employee and train them. Intangible cost is, when an employee leaves an organisation, the company or organisation is losing all the skill, knowledge and experience which are possessed by that employee (augustin et al., 2012). So it is very much essential that every organisation should keep a track of attrition in their organisation and find the reasons that cause attrition and take suitable measures by framing effective human resource policies.

### REVIEW OF LITERATURE

Many researchers conducted studies to understand this phenomenon of attrition and find the factors that cause attrition in an organisation. Researchers conducted the study and found that compensation package, career development, place of work, extended work hours, relationship with superiors, family circumstances, work load, principles of fairness and equity regarding rewards and recognition are some of the reasons for attrition in automotive company (augustin et al., 2012). It is found by researchers that emotional labour, interpersonal tension, work-life balance and work overload are some of the important factors leading to turnover in hotel industry (kavitha et al., 2019). Attrition is also one of the major

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## AN EXPERIMENTAL STUDY WITH GRAPHENE OXIDE ON HIGHSTRENGTH CONCRETE INDUCED WITH RICE HUSK ASH

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### ABSTRACT

The second most-used component on the facility, after water, is this Concrete, which is the most frequently used man-made construction material in the world. It is made by combining the necessary amounts of cementing ingredients, water, aggregates, and occasionally admixtures. Concrete is created when the slurry is poured into moulds and given time to cure. Portland cement, aggregates, and water make up the main ingredients of concrete, while many varieties may include additional cementations components and/or chemical admixtures. It will contain some trapped air and could also have air that was added on purpose using additive or air-entraining cement. Chemical admixtures are widely used to speed up, slow down, make a material easier to work with, use less water for mixing, make a material stronger, or change other features of the concrete. In this work the graphene was used with different proportions. This project focuses on replacement cement with cementitious material called byproducts out of few one is RHA with proportions of 0%, 5%, 10%, 15% and 20% respectively along with GO as 0%, 0.5%, 1.0%, 1.5% and 2%

### INTRODUCTION

The selection of concrete proportions involves a balance between economy and requirements of placeability, strength, durability, density, and appearance. Concrete proportions must be selected to provide workability, consistency, density, strength, and durability, for the particular application. The general types of mineral admixtures are Fly ash (FA), Ground Granulated Blast Furnace Slag (RHA), Silica Fume (SF), Rice Husk ash (RHA), Pozzolanic ash. The graphene is an allotrope of carbon consisting of a single layer of Graphite (pure crystalline carbon) arranged in a hexagonal lattice. A modern material with unique physical properties that could reshape our future. While not a new building material, graphene has been impractical to use in construction since its discovery. In theory, it is an excellent material, as it is incredibly lightweight while being stronger and stiffer than both steel and carbon fiber. potentially, it could be combined with more traditional materials to create stronger beams and cables, allowing for more impressive structures. However, graphene is so difficult to produce that builders have rarely been able to use more than a few flakes of its per project. Until now, that is, as the US' Oak Ridge National Laboratory has developed a new way of producing it using a technique known as chemical vapour deposition.

Concrete has been around for many centuries the first known use of a material resembling concrete was found by the Minoan civilization around 2000BC. During the earlier stages of the Roman Empire around 300 BC, the Romans discovered that mixing a sandy volcanic ash with lime mortar created a hard water resistance substance which we know as concrete. A huge amount of solid waste is generated annually from construction and demolition activities. This has led to the promotion of waste recycling as a major measure to reduce waste and to mitigate the harmful effects of construction activities on the environment. Among



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The selection of concrete proportions involves a balance between economy and requirements of placeability, strength, durability, density, and appearance. Concrete proportions must be selected to provide workability, consistency, density, strength, and durability, for the particular application. The general types of mineral admixtures are Fly ash (FA), Ground Granulated Blast Furnace Slag (RHA), Silica Fume (SF), Rice Husk ash (RHA), Pozzolanic ash. The graphene is an allotrope of carbon consisting of a single layer of Graphite (pure crystalline carbon) arranged in a hexagonal lattice. A modern material with unique physical properties that could reshape our future. While not a new building material, graphene has been impractical to use in construction since its discovery. In theory, it is an excellent material, as it is incredibly lightweight while being stronger and stiffer than both steel and carbon fiber. potentially, it could be combined with more traditional materials to create stronger beams and cables, allowing for more impressive structures. However, graphene is so difficult to produce that builders have rarely been able to use more than a few flakes of its per project. Until now, that is, as the US' Oak Ridge National Laboratory has developed a new way of producing it using a technique known as chemical vapour deposition.

Concrete has been around for many centuries the first known use of a material resembling concrete was found by the Minoan civilization around 2000BC. During the earlier stages of the Roman Empire around 300 BC, the Romans discovered that mixing a sandy volcanic ash with lime mortar created a hard water resistance substance which we know as concrete. A huge amount of solid waste is generated annually from construction and demolition activities. This has led to the promotion of waste recycling as a major measure to reduce waste and to mitigate the harmful effects of construction activities on the environment. Among



## A LABORATORY STUDY ON FIBRE REINFORCED CONCRETE

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### ABSTRACT

Concrete uses fibres to minimise permeability, manage shrinkage, and prevent cracks. Additionally, fibres exhibit outstanding resilience to impact and abrasion. Slurry-infiltrated fiber-reinforced concrete, or SIFCON, is one of the more contemporary building materials. It is a unique variety of fiber-reinforced concrete that contains a lot of fibre. When unexpected or abnormal loads are encountered, it is a special type of building material with tremendous potential for structural applications due to its high strength and large ductility. "Ferro cement is a type of thin-walled reinforced concrete that is frequently made of hydraulic cement mortar and reinforced with layers of continuous wire mesh that are quite small in size and positioned closely together. The mesh can be created from metal or other appropriate materials. In this project, we're employing steel fibres with an aspect ratio of 50 and steel mesh with a 0.62mm diameter and a 5mm spacing. To cast the cylinders, a 1:1 mixture was used (30cm X 15cm). The outcomes of those additions were compared to those of a standard cement mortar.

**Keywords :** hydraulic cement mortar, Ferro cement, Fibres, cement mortar.

### 1. INTRODUCTION

Fibre Reinforced Concrete (FRC) is concrete containing fibrous material which increases its structural integrity. It contains short discrete fibres that are uniformly distributed and randomly oriented. In comparison to normal concrete, fibre reinforced concrete scores higher in toughness, and resistance to impact. Fibre reinforcing has added versatility into concrete so as to overcome its brittleness. They can be circular or flat. The fibre is often described by a convenient parameter called "aspect ratio". The aspect ratio of the fibre is the ratio of its length to its diameter. Typical aspect ratio ranges from 30.

Every type of fibre has been tried out in cement and concrete, not all of them can be effectively and economically used. Each type of fibre has its characteristic properties and limitations. Steel fibres are made of cold drawn steel wire with low content of carbon (C) or stainless steel wire. According to Construction Kanpur Philosophers ISSN 2348-8301, Volume-7, Issue-12, 2020



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## AN ANALYTICAL STUDY ON MULTISTORY BUILDING'S SEISMIC ANALYSIS WITH AND WITHOUT HANGING (FLOATING) COLUMNS

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In India, multi-story structures with floating columns are a common characteristic of modern construction technology. For carrying out the project work, a multi-story commercial building has been chosen. This study emphasizes how crucial it is to openly acknowledge the existence of floating columns while analyzing buildings. Alternative solutions are suggested to lessen the irregularity caused by the floating columns, such as stiffness balancing of the first level and story above. In the article, the load distribution on the floating columns and the different impacts caused by it are also explored. Studies also look at the significance and impacts of forces' lines of action. As part of this project, we will compare the seismic analysis of multi-story buildings with and without floating columns. The equivalent static analysis is carried out on the entire project mathematical 3D model using the software STAAD Pro V8i and the comparison of these models are presented. This will help us to find the various analytical properties of the structure and we may also have a very systematic and economical design for the structure.

**Keywords:** Floating Column, STAAD-PRO, RCC frame, Column Shear

### 1. INTRODUCTION

The open first level is a common and inescapable characteristic of urban multi-story structures in India nowadays. The main reason for adopting this is to provide room for parking or reception lobbies on the first floor. In contrast to the seismic force distribution, which depends on the distribution of stiffness and mass along the height, the total seismic base shear that a building experiences during an earthquake is influenced by the earthquake's natural period.

In addition to how the earthquake forces are transmitted to the ground, a building's general design, scale, and geometry have a significant impact on how it responds to earthquakes. The shortest path must be used to transfer the earthquake forces generated at various floor levels in a structure to the ground; any deviation or discontinuity in this load transfer path results in poor performance of the building. Buildings with vertical setbacks (like the hotel buildings with a few storeys wider than the rest) cause a sudden jump in earthquake forces at the level of discontinuity. Buildings that have fewer columns or walls in a particular storey or with unusually tall storey tend to damage or collapse which is initiated in that storey. Many buildings with an open ground storey intended for parking collapsed or were severely damaged in Gujarat during the 2001 Bhuj earthquake. Buildings with columns that hang or float on beams at an intermediate storey and do not go all the way to the foundation, have



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## A STUDY OF THE STRENGTH PROPERTIES OF CONCRETE WITH STEEL FIBER AND FLY ASH MIXTURE

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### ABSTRACT

When cement and water are combined, concrete is an organic material where fine and coarse particles are bonded together. The concrete has become so prevalent and necessary as a result of its inherent qualities. Concrete offers endless possibilities for inventive uses, structure, and construction methods. It is extremely competitive in the construction materials market thanks to its incredible flexibility and relative affordability in fulfilling a wide variety of requests. In order to meet the higher performance and reliability criteria required by the expanding functional specifications of houses and their ability to survive harsh weather, new cementation methods and concrete composites have to be produced. Environmental considerations and the call for from production to apply discarded materials have additionally been the primary members to latest advances in the field of concrete production. With the development in technologies and the extended area of use of concrete and mortars, the strength of workability, sturdiness and other characteristics of regular concrete want to be changed so as to make it extra appropriate for situations. Including to this is the want to tackle the developing price and shortage of cement. Under these occasions using admixtures is observed to be a vital alternative answer. On this regard, an attempt has been made inside the gift research to degree the workability, compressive electricity, tensile energy and flexicurity of the inclusion of Fly ash (0-30 according to cent) along with crimped steel fibers (zero-1 in step with cent) in concrete. Timber ash is an amalgamation: a pozzolana .Wood ash is produced as a by-product of combustion in wood-fired electricity plants, paper generators and other wood-burning industries. whilst a whole lot of observe has targeted during the last decade at the use of various mixtures inside the manufacture of concrete, enormously little knowledge is to be had on Fly ash fiber reinforced concrete. The scope of the existing studies is to take a look at the workability of Fly ash-based fiber strengthened concrete in terms of compaction factor and to take a look at the performance traits of Fly ash-based totally fiber bolstered concrete in terms of compressive, split tensile and flexural power trendy cubes of 150 X a hundred and fifty X one hundred fifty mm were forged and tested for 28 days and 60 days of compressive electricity. Preferred cylinders with a diameter of one hundred fifty mm and a top of three hundred mm had been forged and examined for split tensile strength. Regular beams of 500mmx100mmx100mm have been cast and tested for flexural power.M30 concrete changed into used as a contrast mixture. The findings were analyzed to draw treasured conclusions on the energy homes of Fly ash fiber strengthened concrete.



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## ANALYSIS ON IMPROVING CONCRETE STRENGTH AND DURABILITY BY USING VARIOUS TYPES OF FIBERS

<sup>1</sup>PAVAN YADAY, <sup>2</sup>PATIL ARUNKUMAR, <sup>3</sup>HIREMATH VEERESH, <sup>4</sup>E.SRAVAN  
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### ABSTRACT

Concrete may be reinforced using a variety of steel fibres. Steel fibres are divided into groups based on how they were made. Concrete must be mixed differently when steel fibres are added to make up for the workability loss brought on by the extra paste required to cover the steel fibres' surface. While using SFRC has a number of technological and economical advantages, there are drawbacks as well. However, they are not likely to cause serious problems. Steel fibres were thought to have detrimental effects on concrete practice (transporting, finishing, and so forth), but experience has shown that these effects are minor. The purpose of this study is to see how different types of steel fibres affect the strength and durability of concrete for the M-40 grade utilizing fibres such as straight fibre, crimped fibre, and hooked fibre. The compressive strength, split tensile strength, flexural strength, and durability of steel fibre reinforced concrete (SFRC) with fibres of 0 percent, 0.5 percent, 1 percent, 1.5 percent, 2 percent, and 2.5 percent by volume of cement are investigated in this work.

**KEY WORDS:** Steel fibers, M-40 grade, compressive strength, Split tensile strength, flexural strength, Durability.

### I. INTRODUCTION

Today's human needs are far more than protection, and as human social organizations have developed, structures must be larger, more widespread, and more firmly established than in the past. Modern constructions are made for strength, durability, and a beautiful look. Driving innovation in engineering and structural construction motivates planners and experts to appear and perform well. Structures can survive climatic conditions including rain, moisture, and a wide range of temperature as determined by the atmosphere in addition to natural effects like earthquakes, tsunamis, and head winds. In the current work, we also investigated several angles including steel filaments and various fibres (Steel fiber). Test with various fixation and diverse size of fiber, were arranged and tried for the compressive quality against traditional cement.

The results of the investigation were documented, and a compressive quality assessment was completed. The work's main goal is to improve Fiber fortified cement (FRC), which is Portland bond concrete enhanced by arbitrarily applied filaments. During the mixing of FRC, a large number of small strands are spread and appropriated randomly in the solid, enhancing solid characteristics in various ways. FRC is a recently developed concrete-based composite material. With its excellent flexural-elasticity, spitting resistance, impact resistance, and remarkable piousness and ice resistance, it has been successfully used in development. It's a persuasive method for constructing durability, stun resistance, and protection against plastic shrinkage fracturing the mortar. Fiber is a little piece of strengthening material with certain qualities. In cross-area, they might be circular, triangular, or level. A useful metric called perspective percentage is used to display the fire on a regular basis. The fiber's perspective proportion is the ratio of its length to its cross-sectional area.

The goal of consolidating strands into a concrete lattice is to increase the composite's toughness and elasticity while also improving its breaking misshapening properties. FRC must be able to compete financially with existing strengthening frameworks in order to be a viable development material. FRC composite properties, for example, break protection, support and increment in strength are reliant on the mechanical properties of the fiber, holding properties of the fiber and framework, and in addition the amount and appropriation inside the network of the filaments.

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The results of the investigation were documented, and a compressive quality assessment was completed. The work's main goal is to improve Fiber fortified cement (FRC), which is Portland bond concrete enhanced by arbitrarily applied filaments. During the mixing of FRC, a large number of small strands are spread and appropriated randomly in the solid, enhancing solid characteristics in various ways. FRC is a recently developed concrete-based composite material. With its excellent flexural-elasticity, spitting resistance, impact resistance, and remarkable piousness and ice resistance, it has been successfully used in development. It's a persuasive method for constructing durability, stun resistance, and protection against plastic shrinkage fracturing the mortar. Fiber is a little piece of strengthening material with certain qualities. In cross-area, they might be circular, triangular, or level. A useful metric called perspective percentage is used to display the fire on a regular basis. The fiber's perspective proportion is the ratio of its length to its cross-sectional area.

The goal of consolidating strands into a concrete lattice is to increase the composite's toughness and elasticity while also improving its breaking misshapening properties. FRC must be able to compete financially with existing strengthening frameworks in order to be a viable development material. FRC composite properties, for example, break protection, support and increment in strength are reliant on the mechanical properties of the fiber, holding properties of the fiber and framework, and in addition the amount and appropriation inside the network of the filaments.

## ANALYSIS ON IMPROVING CONCRETE STRENGTH AND DURABILITY BY USING VARIOUS TYPES OF FIBERS

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College Of Engineering And Research, Hyderabad.

### ABSTRACT

Concrete may be reinforced using a variety of steel fibres. Steel fibres are divided into groups based on how they were made. Concrete must be mixed differently when steel fibres are added to make up for the workability loss brought on by the extra paste required to cover the steel fibres' surface. While using SFRC has a number of technological and economical advantages, there are drawbacks as well. However, they are not likely to cause serious problems. Steel fibres were thought to have detrimental effects on concrete practice (transporting, finishing, and so forth), but experience has shown that these effects are minor. The purpose of this study is to see how different types of steel fibres affect the strength and durability of concrete for the M-40 grade utilizing fibres such as straight fibre, crimped fibre, and hooked fibre. The compressive strength, split tensile strength, flexural strength, and durability of steel fibre reinforced concrete (SFRC) with fibres of 0 percent, 0.5 percent, 1 percent, 1.5 percent, 2 percent, and 2.5 percent by volume of cement are investigated in this work.

**KEY WORDS:** Steel fibers, M-40 grade, compressive strength, Split tensile strength, flexural strength, Durability.

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## An analytical study on the compressive and split tensile strengths of several experimental mixes with different amount of rubber and silica fume

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### ABSTRACT

The environment and human civilization are seriously affected by the growing population. With a constant replacement of 5% cement by lime by weight and an effective waste utilization of crumb rubber and silica fume to produce M30 mix design Rubberized SCC, this study attempts to produce green and sustainable concrete by replacing sand with a combination of equal amounts of crumb rubber aggregates and silica fume in varying percentages of 2.5, 5, 7.5, and 10%. The ideal percentage of 5% for replacing sand with a mixture of crumb rubber and silica fume with several trial mixes with varying proportions is inferred from the results of compressive strength and split tensile strength tests.

**Keywords:** - Rubberized SCC, Lime, Silica fume, Waste utilization, Strength, Concrete

### INTRODUCTION

To meet the demands of a growing population and aid in national growth, the building industry is expanding more quickly. Concrete is one of the most popular and often used building materials because of its durability, strength, and flexibility in applications for civil engineering. Generally speaking, there are several different specialty types of concrete. Due to its high deformability and cohesive nature, self compacting concrete (SCC) is one such unique type of concrete that can be simply laid and consolidated under its own weight without the need for extra vibration, making it suitable to be handled without segregation or bleeding. There are four features of SCC which needed to satisfy according to IS 10262: 2019; which includes filling ability, passing ability, segregation resistance, viscosity and certain guidelines by IS code 10262: 2019 for formulating mix design.

The prime issue in every populous country is waste handling and its management. Currently reutilization of waste solid materials in the construction industry has gained momentum worldwide as it will not only reduce the pollution but at the same time proves to be more economical approach. One such type of waste is generated in the form of scrap tyres.

In this study an effective approach is suggested with an experimental work to solve the menace of crumb rubber disposal. At the same time it targets to meet the ever increasing demand of fine aggregates due to rise in construction activities.

Various researchers have done studies on strength parameters and durability studies of SCC with Ordinary Portland Cement. However few studies are available where Portland Pozzolana Cement with lime is used to study effect of crumb rubber inclusion on SCC.

This study is based on tests that are performed for fresh properties of SCC as per EFNARC guidelines, Strength properties of SCC compressive strength and split tensile strength.

In the present study, the effect of silica fume and on the compressive strength of self-compacting concrete with a 5% replacement of cement by lime was investigated at various mix ratios prepared by considering 2.5 %, 5 %, 7.5% and 10%. Simultaneous use of both limes powder and silica fume transforms normal SCC to better concrete with long term specification. Moreover, adding lime powder makes concrete water resistance. On the other hand, the use of lime powder has better effects than cement on environment as the production of cement from lime stone pollutes the nature with harmful gases. The mixture of lime powder and silica acts better than normal cement in long term this is because lime powder produces more CH gel for the production of C-S-H gel.



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## AN ADAPTIVE STUDY ON CHARACTERISTICS OF ULTRA HIGH PERFORMANCE BY CONCRETE MIXER

<sup>1</sup>E.PRAVEEN KUMAR GOUD, <sup>2</sup>PATIL VIVEKANANDA REDDY, <sup>3</sup>SHAFTI AHMED AXI MUDASAR, <sup>4</sup>MD.AFROZ

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### ABSTRACT

The most often used building material worldwide is concrete. As the concrete industry has developed, more mineral admixtures have been added to cement out of concern for economic efficiency, environmental safety, and resource preservation. However, pressure to minimize cement use through the use of supplemental materials has been brought on by environmental and energy-saving concerns, both in terms of harm from the extraction of raw materials and other carbon material emissions during cement manufacturing. In the twenty-first century, High Performance Concrete (HPC) is the most recent innovation. These days, it is more prevalent and utilized in several notable construction and infrastructure projects. The use of supplemental materials to potentially improve concrete mixes is widely acknowledged. In recent years blast GGBFS, SILICA FUME, FLY ASH when replaced with cement & other materials emerged as a major alternative to the conventional concrete and has rapidly used by the cement industry due to its cement saving, cost saving benefits.

The main objectives of this to investigate the properties of high performance concrete (HPC) like strength, elasticity, plasticity using fly ash, silica fume as mineral admixtures. Mineral admixture like FA, SF, GGBFS are commonly used in the mixture of concrete. The uses of these admixtures increase and improve the properties of concrete like strength and durability. HPC also resist the attack of chemical attacks in hydration and plastic stage

### INTRODUCTION

#### High-performance concrete principles

It must be acknowledged that rather than a fundamental and scientific approach, advancement in the field of high-performance concrete has up until now been the result of an empirical one. Advances in practice have frequently come before in-depth scientific research in concrete technology. Furthermore, although it is not yet able to describe every feature of high-performance concrete in great detail, it is currently possible to explain the higher performance of high-performance concrete on the basis of concepts that can be scientifically proven.

As a consequence, it will be seen in that the selection of concrete-making materials, and in that mix proportions, are no longer governed by pure empiricism, but that it is possible to follow practical guidelines in order to avoid starting over. However, in spite of this progress in the state of the art, we cannot expect that in the near future it will be possible to select 'on paper' the materials and their proportions to make economical and high performance concrete in a given place. In fact, as long as high performance concrete is made of about the same simple and low-cost materials that are used to make usual concrete, their actual composition will not necessarily be the best one for making high-performance concrete. As high-performance concrete still represents a small volume of the concrete market, cement producers are not interested in investing too much in modifying their production processes. Moreover, in a given place, the selection of the materials used to make high-performance concrete will always be limited by economic considerations because, in order to stay technically competitive with usual concrete, the production cost of high-performance concrete will have to be as low as possible

As will be seen, making high-performance concrete is more complicated than producing usual concrete. The reason for this is that, as the compressive strength increases, the concrete properties are no longer related only to the water/binder ratio, the fundamental parameter

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## CONCRETE STRENGTHENING ANALYSIS USING FLY ASH AGGREGATES

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### ABSTRACT

In the past, several researchers have been killed in the area where fly ash is used. It is mostly focused on utilizing fly ash instead of cement, although producing artificial aggregates from fly ash also facilitates the use of large amounts of ash in concrete. Due to its extensive use, which also decreases environmental degradation and the depletion of natural resources, the sector is now very interested in this area. The production of light weight aggregates using a pelletize and cold bonding as the curing method is the focus of this research in particular. The study demonstrates that cold bonded fly ash aggregates may be used as an aggregate replacement material in concrete superior than natural gravel in terms of these fly ash aggregates' measured qualities. The strength property and density of concrete made with artificial fly ash aggregates and natural gravel have been additionally studied which confirms that creation of fly ash aggregates in concrete reduces the compressive strength however meets the desired strength for use as a structural material.

**Key Words:** Fly Ash, Concrete, Aggregates, Compressive strength.

### I. INTRODUCTION

In India, where there is an increasing need for electricity, 70% of the power is produced by thermal power plants. These facilities have the potential to cause water contamination, air pollution from particle emissions, and fly ash shortages owing to land availability [1]. Additionally, the high ash concentration of the low-quality coal from India makes the disposal issue worse. Around 200 million tones of fly ash are expected to be produced between 2013 and 2014.

Fly ash is now frequently utilized as a substitute for cement, a basis for pavement, blocks, and other construction materials rather than being dumped in landfills. Applications like embankment fill or aggregate replacement material should be taken into consideration when using fly ash in big quantities [2]. Construction industry is growing very fast manner. The availability of raw materials for the construction is facing many problems in most of the world.

The continuous usage of natural resources for the production of the concrete in some locations creates many threatens to the environmental conditions [3]. Researchers have carried out extensive work on this area are trying for new alternative materials for this deficiency in the construction industry. The durability properties of concrete made with fly ash aggregate cured by different methods and found that sintered aggregates produce better strength compared to cold bonded aggregates.

But found that the fly ash aggregates produced by normal curing showed comparable results with the aggregates produced with other methods of curing, when the number of days of curing is increased [4]. The properties of fly ash aggregates produced by normal cold bonding technique is discussed and compared with natural gravel. Concrete made out of these aggregates were also studied for the strength criteria to get an idea of their behavior as a replacement material [5].

### II. LITERATURE SURVEY

Suzuki M, Meddah MS, Sato R [6] used three types of cold bonded cement based fly ash aggregates for the production of concrete. The study indicates that type of light weight aggregate and water to binder ratio are the significant factors influencing strength of concrete.

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In the past, several researchers have been killed in the area where fly ash is used. It is mostly focused on utilizing fly ash instead of cement, although producing artificial aggregates from fly ash also facilitates the use of large amounts of ash in concrete. Due to its extensive use, which also decreases environmental degradation and the depletion of natural resources, the sector is now very interested in this area. The production of light weight aggregates using a pelletize and cold bonding as the curing method is the focus of this research in particular. The study demonstrates that cold bonded fly ash aggregates may be used as an aggregate replacement material in concrete superior than natural gravel in terms of these fly ash aggregates' measured qualities. The strength property and density of concrete made with artificial fly ash aggregates and natural gravel have been additionally studied which confirms that creation of fly ash aggregates in concrete reduces the compressive strength however meets the desired strength for use as a structural material.

**Key Words:** Fly Ash, Concrete, Aggregates, Compressive strength.

### I. INTRODUCTION

In India, where there is an increasing need for electricity, 70% of the power is produced by thermal power plants. These facilities have the potential to cause water contamination, air pollution from particle emissions, and fly ash shortages owing to land availability [1]. Additionally, the high ash concentration of the low-quality coal from India makes the disposal issue worse. Around 200 million tones of fly ash are expected to be produced between 2013 and 2014.

Fly ash is now frequently utilized as a substitute for cement, a basis for pavement, blocks, and other construction materials rather than being dumped in landfills. Applications like embankment fill or aggregate replacement material should be taken into consideration when using fly ash in big quantities [2]. Construction industry is growing very fast manner. The availability of raw materials for the construction is facing many problems in most of the world.

The continuous usage of natural resources for the production of the concrete in some locations creates many threatens to the environmental conditions [3]. Researchers have carried out extensive work on this area are trying for new alternative materials for this deficiency in the construction industry. The durability properties of concrete made with fly ash aggregate cured by different methods and found that sintered aggregates produce better strength compared to cold bonded aggregates.

But found that the fly ash aggregates produced by normal curing showed comparable results with the aggregates produced with other methods of curing, when the number of days of curing is increased [4]. The properties of fly ash aggregates produced by normal cold bonding technique is discussed and compared with natural gravel. Concrete made out of these aggregates were also studied for the strength criteria to get an idea of their behavior as a replacement material [5].

### II. LITERATURE SURVEY

Suzuki M, Meddah MS, Sato R [6] used three types of cold bonded cement based fly ash aggregates for the production of concrete. The study indicates that type of light weight aggregate and water to binder ratio are the significant factors influencing strength of concrete.



## EXPLORING THE STRENGTH FEATURES OF CONCRETE BY PARTIALLY SUBSTITUTING THE CEMENT BY VARIOUS ADDITIVES

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### ABSTRACT

The most common artificial building material used worldwide is concrete. Its flexibility and ability to arrange the solid of any essential attribute dependant on the earth are its most noteworthy qualities. Without excessive cement use, the current state of human development is unfathomable. The most important component of cement is the bond. Tragically, the production of concrete releases a lot of ozone-depleting chemicals and might harm the environment. In this way, reducing the dependency on bond to obtain quality in concrete is unavoidable for the progress of economic life. This is the main reason for getting a good replacement bond: to acquire high-quality cement with little to no effort. Besides, present day developments require extremely high quality in solid, which is just conceivable by blending a sufficient measure of added substances in the solid. Silica, metakaolin and slag smoke are modern waste items broadly accessible in India. Because of the most recent guidelines and guidelines forced, their expulsion has gotten costly. In this manner, it is important to locate a reasonable valuable approach to utilize these waste materials. These materials have high silicon content and pozzolanic properties, in this way they can be utilized as bond substitutes in the solid blend and can likewise be utilized as a blend to acquire high quality. Bowing, pliable and compressive qualities are the three most significant criteria that decide the presentation of cement in any field use. In this manner, it is relevant to acquire the impact of these added substances on the twisting quality, rigidity and pressure of cement. A similar report can investigate the general impact of these added substances on the quality of cement with the goal that the most appropriate added substance can be utilized dependent on any current circumstance.

**Key words:** bond substitution, solid added substances, twisting quality, elasticity, compressive quality.

### INTRODUCTION

The most commonly used fake building material worldwide is concrete. The value and aesthetics, as well as the durability of reinforced solid structures, were created during the majority of the last century using smooth round bars of gentle steel and normal Portland bond (OPC), the ease of accessibility of the solid's component materials, and the awareness that practically any combination of segments results in a mass of solid that has drawn criticism. Without considering the strength of the buildings, quality has been emphasized.

The strength of reinforced solid structures is moving south as a result of the opportunities anticipated; this adventure looks to be gaining momentum as it heads towards collapse. Common Portland bond (OPC) is one of the principle fixings utilized in the creation of cement and has no option in the common development area. Tragically, bond creation includes the emanation of a lot of carbon dioxide into the climate, a significant commitment to the nursery impact and a worldwide temperature alteration, so it is unavoidable to search for another material or supplant it to some degree with another material. . The quest for any material of this sort, which can be utilized as another option or as a supplement to concrete, should prompt worldwide manageable improvement and the most reduced conceivable natural effect. Along these lines, for this, we have to include pozzolanic materials together with a super plasticizer with a low concrete to water proportion.

Moreover, concrete is commonly the most gigantic component of individual material in the constructed condition. On the off chance that the inherent vitality of the solid can be decreased without diminishing execution or expanding costs, huge ecological and financial advantages can be accomplished. Solid comprises for

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## SIGNIFICANT GROWTH IN HOME AUTOMATION AND ITS SECURITY SYSTEM USING ARDUINO

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### ABSTRACT

Because automation enables activities to be accomplished with less human interaction and more effectively, it has become increasingly important in today's society (for example, in household and industrial automation). The practise of automating household chores and appliances so they may be managed remotely via a phone or computer is known as home automation. A home security system includes alarm systems, smoke detectors, security cameras, and other sensors. In this project, a home automation and security system is created. The HC-05 Bluetooth module and an Arduino UNO R3 microcontroller board were used to create the Solar Home Automation and Security System, which can be controlled remotely using a smartphone. Arduino is a platform for making electronic projects that is open-source and free. At any point in time, it may be readily programmed, wiped, and reprogrammed.

### 1. INTRODUCTION

Due to the reduction in the need for human intervention, automation (such as industrial automation and residential automation) has become more and more important in today's society. in a more thoughtful manner A home security system includes an alarm system, smoke detectors, and video cameras. Furthermore to any additional sensors that is attached to it

In this project, a home automation and security system is created. Using an Arduino UNO R3 microcontroller board, Smart Home was created. You are able to automate and secure your home using the HC-06 Bluetooth module. Using a Smartphone, the system is managed. The creation of electronic projects Programming, erasing, and reprogramming are easy processes. Solar energy is available at all times, regardless of the day, the hour, the day, the week, or the minute type of energy that comes from the sun.

### 2. METHODOLOGIES

Bluetooth based Home Automation System :

According to government statistics, the number of Internet users has exceeded 2 to 39 million and the number of SIM cards in circulation has increased by about 400% since the beginning of Myanmar's telecommunications revolution in 2014. .. Myanmar is currently a country with an official population of 53 million and has at least 33



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## **EXTRACTION OF SOLAR INVERTER ENERGY USING MAXIMUM POWER POINT TRACKING (MPPT) MECHANISM**

<sup>1</sup>K.Bheema, <sup>2</sup>G.Manoj Kumar, <sup>3</sup>Dr.K.Srinivasan, <sup>4</sup>S.N.V.Prasad Reddy

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### **ABSTRACT**

Solar energy is the only source that can supply the large amount of energy needed to meet the rising demand for electricity across all nations. The fastest-growing renewable energy among all resources, it is also the most widely used. Solar energy is the only source of energy that can be added to indefinitely that is neither environmentally detrimental nor causes any difficulty in construction or extraction. We are employing the mppt method to capture the most solar energy possible. We use perturbation and observation in the mppt technique to make sure that it can capture the most energy from the sun. Consequently, we are demonstrating the simulation results of solar inverter using mppt mechanism.

### **INTRODUCTION**

The renewable energy sources, such as solar energy, are limitless or environmentally benign. The usual energy sources are finite and only last for a finite amount of time. The photovoltaic effect's fundamental working principle is utilised by solar cells. The photovoltaic effect refers to the phenomenon whereby light that strikes a photovoltaic cell is transformed to energy. Since a photovoltaic cell is a type of p-n junction, it generates direct current (dc). Semiconductor materials were used to make it. When a PV cell is powered, the semiconductor material basically acts as a conduit for the continuous photons that leave the cells and allow electricity to flow. That flow is continuous and it is one direction. The maximum power point tracking System is to get the maximum power from the Solar panel or array The Boost Converter is also called as step up transformer. It is increases the power output. in Boost converter the output voltage is greater than the input voltage. The inverter is converted to Ac power to dc power. this power is used to direct dc loads and connected to grid for house hold purposes and used ac loads connected the inverter the inverter converters the do to ac power.

### **STRUCTURE AND WORKING**

Solar panels are made up of individual solar cells. There are three kinds of solar panels: monocrystalline, polycrystalline, and hybrid panels. For this system, we are using hybrid panels. These panels are expensive, but the structure of the panels combines PV and solar thermal technology into a single module, or we can say that the hybrid pv cell consists of organic and inorganic semi conductors. It has a higher efficiency than the other two types of panels, ranging from 45 to 60 percent. During cloudy days, efficiency decreases due to low solar radiation emission. For energy conversion, solar cells have two junctions: p-junction and n-



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## FAULT CURRENT OF ADJACENT AND NON- ADJACENT BROKEN ROTOR BARS OF INDUCTION MACHINE USING FINITE ELEMENT METHOD

<sup>1</sup>V.H.Sowjanya, <sup>2</sup>V.Ravi Kumar, <sup>3</sup>J.Sai Kiran, <sup>4</sup>A.Deepak

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### ABSTRACT

Induction motors are widely used in industry which is drive for different industrial loads. The failure of these motors results in expensive maintenance and revenue losses. In three-phase squirrel-cage induction motors, broken rotor bars and end-rings faults can damage the machine and to be replaced which increases the capital cost. BRB are due to frequent on and off of the motor, manufacture defect, and transient loading conditions. These defects produce uneven flux distribution, distorted current spectrum, and torque oscillations. The finite element method (FEM) is a numerical analysis to determine the performance of the machine with BRB currents. In this paper both healthy and broken rotor cage is simulated in ALTAIR FLUX software. Current response of healthy rotor bar and broken rotor bars, the magnetic flux distribution and magnetic flux density are observed with simulation results. Finally inter bars currents due to BRB increases the magnitude of the currents in healthy bars with adjacent and non-adjacent with broken rotor bars can the reduce the performance and lifespan of the machine.

### INTRODUCTION

Heavy-loaded induction motors, especially those that are started and stopped often, are prone to faults such as rotor broken bars and end rings, which create asymmetry of the squirrel-cage rotor. Such flaws disrupt the working of the motor and reduce its life span. As a result, diagnosing and detecting defects in induction motors can help to maintain the motor's high performance and normal lifetime. Diagnosing and detecting defects in induction motors can help to maintain the motor's high performance and normal lifetime. Induction machine failures are typically classified into three primary classes based on the main machine components namely, bearing, stator, and rotor defects. According to a number of independent studies, bearing failures account for around of all defects related with induction devices. Meanwhile, stator winding defects account for an additional of induction machine failures. Although the processes of stator and bearing failures varies somewhat across different types of electric machines, these defects are known to be a prevalent problem in other forms of electric machines, such as synchronous, brush less dc, reluctance, and so on. Furthermore, rotor failures account for around of all induction machine failures. These defects, however, are unique to squirrel cage induction motors, as contrasted to bearing and Stator faults.

Inter-laminar currents, also known as inter bar currents, induced by faults in the rotor core laminations.

- 1) Rotor end-ring coupling failures.
- 2) Rotor bar failures.



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Induction motors are widely used in industry which is drive for different industrial loads. The failure of these motors results in expensive maintenance and revenue losses. In three-phase squirrel-cage induction motors, broken rotor bars and end-rings faults can damage the machine and to be replaced which increases the capital cost. BRB are due to frequent on and off of the motor, manufacture defect, and transient loading conditions. These defects produce uneven flux distribution, distorted current spectrum, and torque oscillations. The finite element method (FEM) is a numerical analysis to determine the performance of the machine with BRB currents. In this paper both healthy and broken rotor cage is simulated in ALTAIR FLUX software. Current response of healthy rotor bar and broken rotor bars, the magnetic flux distribution and magnetic flux density are observed with simulation results. Finally inter bars currents due to BRB increases the magnitude of the currents in healthy bars with adjacent and non-adjacent with broken rotor bars can the reduce the performance and lifespan of the machine.

### INTRODUCTION

Heavy-loaded induction motors, especially those that are started and stopped often, are prone to faults such as rotor broken bars and end rings, which create asymmetry of the squirrel-cage rotor. Such flaws disrupt the working of the motor and reduce its life span. As a result, diagnosing and detecting defects in induction motors can help to maintain the motor's high performance and normal lifetime. Diagnosing and detecting defects in induction motors can help to maintain the motor's high performance and normal lifetime. Induction machine failures are typically classified into three primary classes based on the main machine components namely, bearing, stator, and rotor defects. According to a number of independent studies, bearing failures account for around of all defects related with induction devices. Meanwhile, stator winding defects account for an additional of induction machine failures. Although the processes of stator and bearing failures varies somewhat across different types of electric machines, these defects are known to be a prevalent problem in other forms of electric machines, such as synchronous, brush less dc, reluctance, and so on. Furthermore, rotor failures account for around of all induction machine failures. These defects, however, are unique to squirrel cage induction motors, as contrasted to bearing and Stator faults.

Inter-laminar currents, also known as inter bar currents, induced by faults in the rotor core laminations.

- 1) Rotor end-ring coupling failures.
- 2) Rotor bar failures.



## FAULT CURRENT OF ADJACENT AND NON- ADJACENT BROKEN ROTOR BARS OF INDUCTION MACHINE USING FINITE ELEMENT METHOD

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## DETECTION AND AVOIDANCE OF OBSTACLE PATH CONTROL ROBOT USING INTELLIGENT PATH CONTROL METHOD

<sup>1</sup>V.H.Sowjanya, <sup>2</sup>V.Deepthi, <sup>3</sup>G Masthan Reedy, <sup>4</sup>K.Siddartha

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The Automatic High Beam Adjustment Using IR Sensor is presented in this study. This IR sensor detects the high beam from the opposing vehicle and sends a signal to the relay, which then switches from NC to NO and activates the vehicle's low beam. The opposite vehicle also has an IR sensor, so the process repeats itself until both vehicles are on low beam. This prevents night accidents caused by improper headlight use. The path controlled may identify an impediment using an ultrasonic sensor and stop until the obstacle is removed. This sort of robot may perform a variety of duties in the workplace, including material handling. In industries, these robots can be utilized to replace traditional conveyor belts as automated equipment transporters. They can also be used in the home, and one of the more interesting uses for this path-controlled robot is in health care management. Because this smart path-controlled robot can detect obstacles, it will not be easily harmed because it will halt moving until the obstruction is eliminated or the course is adjusted. This capacity of the robot expands its applicability, particularly in industries, because impediments are widespread in any job, and if the robot is unable to identify the obstruction, it will be destroyed. As a result, this intelligent path control has an added benefit wherever it is deployed.

**Keywords :** Robot, Path Controlled, Sensors, Obstacles, Industries

### 1. INTRODUCTION

The main objective of any robot is to do less work for people. Depending on the purpose, various robot kinds are created for use in real-world applications. In any workplace, proper monitoring is always needed for increased performance. This resourceful and intelligent path-controlled robot can be used in industries to move objects from one place to another. This robot's fit and forget feature, which allows it to operate totally autonomously without the need for manual control, is the main factor in its suitability for the delivery of goods. In terms of effectiveness and usefulness, this is what sets the line follower robot apart from other conventional robots. Because there is no specific path for the robot, a standard obstacle-avoiding robot cannot assist in the movement of products. It will proceed at random, avoiding obstacles, and will fail to make the required judgment. The obstacle-avoiding robot's mobility is uncontrollable. Path-controlled robots have additional applications when this factor is taken into account. This path-following robot can be made smarter and more sophisticated by adding the ability to identify impediments. This improves the working of the path-controlled robot because in any work environment obstacles are common, so if the path controlled is not able to detect any obstacles on its path it will collide with them and will be severely damaged. Adding the features of obstacle avoiding robot to a traditional path-controlled robot prevents any damage to the robot. This intelligent robot can

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## OPTIMIZATION TECHNIQUES FOR DOUBLE CONDENSING CHAMBER SOLAR STILL AND CONVENTIONAL SOLAR STILL

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### ABSTRACT

Stalinized water needs to be transformed into fresh water using solar stills. To accomplish the required result, many solar still models and designs are employed. The productivity of this work will be increased by using a solar still with a separate condensing chamber. Condensing chamber performance is compared to traditional still performance in terms of energy and energy efficiency. It was shown that the typical solar still's exergy efficiency is significantly inferior to that of a still with a separate condensing chamber (60.8% greater).

**Keywords:** Energy, Solar still, separate condensing chamber solar still, Exergy, efficiency.

### 1. INTRODUCTION

The amount of salty water on earth is around 97%. Glaciers and polarized water make about 2% of the total water on planet. Fresh water makes up 1% of all water and may be used. The many sources of portable water, including rivers, lakes, and underground aquifers, have been polluted as a result of population increase and industrial activity [1, 2]. Therefore, in this instance, solar technology is still being researched and can be utilized to turn saltwater into freshwater. Solar stills are incredibly straightforward, inexpensive, and simple to build [3]. They operate on the evaporation and condensation theory. As a renewable energy source that may be utilized again and again, solar energy is widely available on Earth. Solar distillation is majorly one of the processes which can be used for water purification.

Different designs of solar still have been constructed by different researchers and performance has been compared. Many researchers have studied the performance evaluation of solar stills by using energy or exergy analysis. Energy and Exergy analysis has also been done to see the efficiency of the still. Torchia et al [4] have carried out the exergy analysis of a single basin passive solar still their result shows the collector component has the higher irreversibility rates of solar still and also, this rate increases with the increase of solar radiation intensity due to the increase of temperature of various component of solar still. Zooriet al [5] has investigated the effect of mass flow rate on energy and exergy of a weir type cascade solar still the results obtained showed that the maximum energy and exergy efficiencies are obtained at the minimum inlet brine flow. Raghvendra Singh et al [6]. In this research paper, a comparative energy and exergy analysis of various conventional solar distillation systems has been presented. The study includes passive solar distillation systems such as single and double slope solar stills. It has been found that the energy, exergy and





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## ANALYZATION ON THE PERFORMANCE OF THREE SIMILAR HEAT EXCHANGER TUBE BUNDLES

<sup>1</sup>K.Baba Saheb, <sup>2</sup>James Prasada Rao Boggarapu, <sup>3</sup>Karthik Puppala, <sup>4</sup>Israrul Haque  
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### ABSTRACT

This research proposes an examination of the performance of three distinct tube bundles for a specific heat exchanger. These three varieties are referred to as corrugated, smooth, and micro-finned tubes. After designing a heat exchanger with a smooth tube bundle, simulation is carried out. Micro Fin and corrugation over tube are utilized independently for the same heat exchanger in a practical scale, and their performance is simulated. Additionally, performance analysis compares the rate of heat transmission with the pressure decrease.

**Keywords:** Micro-Fin, Tube bundles, HX, tube, CFD, fin, corrugation.

### I. INTRODUCTION

There are several uses for heat exchangers, including in evaporators, radiators, condensers, coolers, etc. Each of them is a type of heat exchanger. Heat exchangers are used by the majority of industries. They come in a variety of varieties, but all of them are used to transmit heat between two materials (fluids). Phase change also occurs in the evaporator and condenser during the heat-exchanging operation. A heat exchanger's performance depends on a variety of factors. To increase heat transfer rate, parameters must be optimized. Research on optimum parameters for a certain heat exchanger design has been investigated in the literature. It hasn't yet reached saturation.

For a specific heat exchanger, a comparison of three distinct tube bundles is put forth in the current study. Smooth, micro finned and corrugated tubes are the three varieties. The use of a heat exchanger will be designed with smooth tube bundle and simulated. Micro fin and corrugation over tube is applied separately for same heat exchanger in feasible size and simulated for performance. Besides, comparison is done with heat transfer rate and pressure drop.

### 2. LITERATURE REVIEW

Bhuiyan A.A. et al present numerical study of 3d thermal and hydraulic characteristics of wavy fin and tube heat exchanger. Numerical visualizations are used to study the thermal and hydraulic performance of four row wavy staggered fin and tube heat exchanger. In this paper, the effects of tube arrangements, different geometrical parameters and inlet flow angles are investigated in terms of heat transfer and pressure drop and efficiency for the wavy fin-and-tube heat exchanger for turbulent flow regime using k- $\omega$  turbulence model with 5% turbulence intensity. The tube arrangement and the geometrical parameters such as pitch, wavy angle and inlet flow angle

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## **A FOUR STROKE PETROL ENGINE'S WAVY FIN'S CONCERT EVALUATION DURING HEAT TRANSFER**

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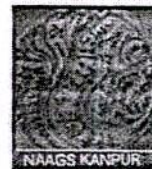
### **ABSTRACT**

An essential component of the IC engine that experiences high temperatures is the engine head. On the surface of the head, fins are included to speed up heat transmission and cool the head. The head's internal heat dissipation must be understood. The use of fluid or air speeds up heat transmission because of the fin structure's waved appearance. We are aware that increasing surface area also speeds up heat transmission. The primary goal of employing these cooling fins is to use air to cool the engine head. The goal of this work is to examine the heat transfer rate using various geometries with the same material and determine temperature variance distribution with respect to time.

**Keywords:** IC Engine, heat transfer, wavy fins, cylinder head.

### **INTRODUCTION**

In an internal combustion (IC) engine, the heat transmission to the working fluid takes place inside the engine, typically through the burning of the fuel with oxygen from the air. Heat is used by internal combustion engines to transform the energy of fuel into power. In an internal combustion engine, all fuel energy is transformed to power. The surplus heat must then be eliminated once the heat has been converted to power. Because of the irregular engine temperature throughout the combustion process, heat is transferred to the environment by low-temperature fluids. Engine parts will malfunction owing to high temperatures if the extra heat is not eliminated. High temperature locations are displaced by low temperature areas by heat. When gasoline in an engine oxidises (burned) heat is produced. Additional heat is also generated by friction between the moving parts. Only approximately 30% of the energy released is converted into useful work. The remaining (70%) must be removed from the engine to prevent the parts from melting



## **A FOUR STROKE PETROL ENGINE'S WAVY FIN'S CONCERT EVALUATION DURING HEAT TRANSFER**

<sup>1</sup>N.Srikanth, <sup>2</sup>D Paramesh, <sup>3</sup>B Rakesh, <sup>4</sup>Machunuri Srikanth

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### **ABSTRACT**

An essential component of the IC engine that experiences high temperatures is the engine head. On the surface of the head, fins are included to speed up heat transmission and cool the head. The head's internal heat dissipation must be understood. The use of fluid or air speeds up heat transmission because of the fin structure's waved appearance. We are aware that increasing surface area also speeds up heat transmission. The primary goal of employing these cooling fins is to use air to cool the engine head. The goal of this work is to examine the heat transfer rate using various geometries with the same material and determine temperature variance distribution with respect to time.

**Keywords:** IC Engine, heat transfer, wavy fins, cylinder head.

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## ANALYSIS OF THE REDUCTION OF ELASTIC PROPERTIES USING COMPOSITES MADE OF BANANA FIBERS

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### ABSTRACT

Making composite materials with banana fiber and resin is a wonderful idea. Additionally, the effect of resin and banana fiber planning on composites has been investigated. Adding 0.15 volume percent of resin to banana fiber increases the composites' effect strength by 106% and their elasticity by 53.5%, respectively. When a resin volume portion of 0.17 is used and a resin and banana fiber interleaving strategy is used, the stiffness exhibits the highest value. But when a smaller amount of resin is used, a unique blend of banana fiber and resin exhibits the highest level of flexibility.

**Keywords:** Banana fibers, composite material, natural fibre,

### INTRODUCTION

Researchers have recently become interested in multi-component composite materials made of two or more fiber families. This is due to the fact that using only one type of fiber has shown to be insufficient for adequately addressing all the technical and financial issues they have encountered while creating fiber reinforced composites. These kinds of composites expand the compositional options available for their creation and provide even another dimension to the possible adaptability of fiber reinforced composite materials. The performance of the product can be varied thanks to the combination of high- and low-performance fibers. Numerous studies on natural fibre hybrid composites show that using cheaper natural fibers reduces the material cost. The mechanical and physical properties of natural fibre reinforced plastics reach the values of glass fibre reinforced system only on certain conditions. Investigations on lignocellulosic fibre composites have shown that the properties of the fibre can be better utilised in hybrid composites [1-7]. Mohan and Kishore [2] have reported that glass has got good reinforcement effect along with jute. Clark and Ansell [3] have reported improvement of various mechanical properties of jute-glass hybrid laminates with different arrangements of jute and glass in the laminate. Pavithran et al. [4] have studied the mechanical properties of coir-glass hybrid composites containing varying amounts of glass fibre. They have noticed a considerable enhancement in the mechanical properties by the incorporation of very small volume fraction of glass. Studies on sisal-glass in polyester have showed a linear increase in the work of fracture by varying the volume fraction of the glass at the core [5]. Attempts have been made in our laboratory to prepare hybrid composites of sisal and glass in polyethylene and oil palm empty fruit bunch fibre and glass in PF. It has been reported that addition of glass has improved the orientation characteristics and thereby the tensile strength of the composites [6]. A ratio of 0.26:0.74 volume fraction of glass and oil palm fibre gave 23% improvement in the Izod impact strength of the composite. Better properties were given by intimately mixed hybrid composites [7].

There is a conservative notion that the strength of a collection of fibres is governed by the fibre component with the smallest elongation to break. The traditional belief is that materials with significant differences in breaking strains will not share the same load path. Based on this view, when a collection of fibres is uniformly strained, the collection tends to break as the strain level reaches the breaking strain level of the fibre which has the smallest breaking strain level. A subsequent infinitesimal increase in strain causes all those fibres characterised by the smallest breaking strain to fail. The sudden transfer of load to the remaining unbroken fibres is presumed to lead to catastrophic failure. Therefore the ultimate strength of the system is

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## ASSISTANCE OF AUTOMATED BAR FEEDING AND CUTTING MACHINE ON HUMAN EFFECT

<sup>1</sup>K.Suresh, <sup>2</sup>K Swathi, <sup>3</sup>M Manasa Priyadarshini, <sup>4</sup>Mohammed Omer Khan

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### ABSTRACT

Preset paper tells about reducing the amount of labor required by people to repeatedly cut pipes while also offering a handy device to hold and support the pipes/rods while cutting. The topic is being worked on as part of a mechanical B.E. project. It is a type of intelligent machine. Square or round bars must be worked on various machines in a variety of industrial applications to create machine parts like shafts, bolts, screws, etc. For the purpose of mass producing such components, this requires cutting an increasing number of pieces. A machine tool for cutting metal, the bar feeding mechanism is made to feed the metal. The equipment is specifically designed for mass manufacturing, and it provides a quicker and more effective means of feeding the metal. The clamping arrangement can be varied according to need of operations suitable. The overall system is compact in size, light weight, modular and flexible to be used in small works jobs that need batch production. The setup overall configuration can be adopted by a semi-skilled worker easily and can vary the operations by making certain small changes. The system even has the potential to add up a PLC system to control its overall working with ease and with less effort provided. This system has the potential to adopt higher level of automation if desired in future.

**Keywords-** Single cylinder , Metal Feed Mechanism , Bar Feed Mechanism

### INTRODUCTION

A metal-cutting machine tool that feeds the metal is the bar feeding mechanism. The equipment is designed specifically for mass manufacturing, and it provides a quicker and more effective way to feed metal or wood. There are three main building components in an automatic bar feeding mechanism. They are the sensor unit, cutting mechanism, and bar feed mechanism. In the realm of engineering, a variety of cutting machine types are employed to meet the demands. The bar dimension to be cut is determined using an IR sensor unit.

The word pneumatic, or pnuma in Greek, implies breathing wind. The study of air flow and associated manifestations is called pneumatics, which comes from the Greek term pnuma. Today pneumatics is mainly understood to mean the application of air as a working medium in industry especially the driving and controlling of machines and equipment.

Pneumatics has for some considerable time been used for carrying out the simplest mechanical tasks in more recent times has played a more important role in the development of pneumatic technology for automation. Pneumatic systems operate on a supply of compressed air which must be made available in sufficient quantity and at a pressure to suit the capacity of the system. When the pneumatic system is being adopted for the first time, however it will indeed be necessary to deal with the question of compressed air supply.

The key part of any facility for supply of compressed air is by means using reciprocating compressor. A compressor is a machine that takes in air, gas at a certain pressure and delivered the air at a high pressure. Compressor capacity is the actual quantity of air compressed and delivered and the volume expressed is that of the air at intake conditions namely at atmosphere pressure and normal ambient temperature, pressure and volume of a particular quantity of gas. This paper is structured as follows. Section II gives the concept of the

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## REGENERATIVE BRAKE MACHINE FOR STORING ELECTRICITY AND TRANSMITTING FLYWHEEL PRESSURE AS A TORQUE TENDING

<sup>1</sup>K.Prahalad Reddy, <sup>2</sup>Ch Swathi, <sup>3</sup>K Madan, <sup>4</sup>V Rajesh

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### ABSTRACT

There may be a need for precision technology that recovers the energy, which is often squandered, in the modern world, when there are energy problems and resources are depleting more quickly. Therefore, one of those helpful technologies specifically for autos is the regenerative braking system. Regenerative braking is an energy-recovery technique that slows down a moving item or vehicle by transforming its Kinetic Energy (K.E.) into a form that may be utilized immediately or saved until needed. Regenerative braking systems allow us to improve the K.E. of cars to a degree that was lost during some point in the braking method. The converted K.E. is saved for future use or is fed returned to the ability machine of the car. This power is often saved at some stage in a battery or bank of capacitors for later use. Energy additionally may be stored with the assistance of a rotating flywheel that is one some of the predominant inexpensive and effective technique of storing and regenerating power. The present invention presents electricity-storing regenerative braking machine by way of transmitting the flywheel pressure as a torque tending to oppose the ahead rotation of a wheel on applying the brakes.

A brake-pad assembly, established concentrically with the hub of a floor-enticing wheel, is actuated upon braking to supply frictional engagement among the hub and snatch mechanism, at the same time as making use of a decelerating torque to the wheel. The unique braking mechanism is selectively held in position by way of a rider-managed clutch mechanism, to build up strength over several braking occasions. Vehicles pushed by electric cars use the motor as a generator when the usage of regenerative braking and its output is supplied to an electrical load. The switch of electricity to the load affords the braking impact and regenerates energy.

**Keywords:** Regenerative Braking, Generator, Brake pad, Energy Recovery, Flywheel.

### 1. INTRODUCTION

Due to the absence of reliable energy sources, improving economy and lowering exhaust gas emissions have come to dominate modern vehicle studies in recent years. Commercial vehicles, such as garbage trucks and delivery vehicles, lose a significant amount of kinetic energy during routine braking and constant force at low speeds on particular city routes, resulting in better fuel consumption and Green House Emission Gas (GHG) emission than other on-street vehicles. There have been several attempts to improve vehicle shape. Exhaust Gas Recirculation (EGR) and Diesel Particulate Filter (DPF) technology combined is one of the most efficient ways to reduce vehicle emissions, especially for NOx and soot. However, this approach isn't always able to reduce the GHG emission since the low temperature combustion of this era results in increasing the gas penalty. Sacrificing engine performance in exchange for reduced pollutants cannot fundamentally resolve the energy crisis. In order to gain overall GHG reduction objectives, a robust reduction is wanted especially for commercial motors.

Regenerative strength era is one of the key features of electrified vehicles. It lets in the vehicle to seize a exquisite amount of the kinetic energy misplaced in the course of braking or decelerating for reuse. That is pronouncing, power recovery generation can appreciably convey down the energy intake of electrified car, specifically in city operated route. Generally, there are regenerative energy approaches that have been carried out to business vehicles: Regenerative Braking System and Boost Recuperation System. The former is typically

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There may be a need for precision technology that recovers the energy, which is often squandered, in the modern world, when there are energy problems and resources are depleting more quickly. Therefore, one of those helpful technologies specifically for autos is the regenerative braking system. Regenerative braking is an energy recovery technique that slows down a moving item or vehicle by transforming its Kinetic Energy (K.E.) into a form that may be utilized immediately or saved until needed. Regenerative braking systems allow us to improve the K.E. of cars to a degree that was lost during some point in the braking method. The converted K.E. is saved for future use or is fed returned to the ability machine of the car. This power is often saved at some stage in a battery or bank of capacitors for later use. Energy additionally may be stored with the assistance of a rotating flywheel that is one some of the predominant inexpensive and effective technique of storing and regenerating power. The present invention presents electricity-storing regenerative braking machine by way of transmitting the flywheel pressure as a torque tending to oppose the ahead rotation of a wheel on applying the brakes.

A brake-pad assembly, established concentrically with the hub of a floor-enticing wheel, is actuated upon braking to supply frictional engagement among the hub and snatch mechanism, at the same time as making use of a decelerating torque to the wheel. The unique braking mechanism is selectively held in position by way of a rider-managed clutch mechanism, to build up strength over several braking occasions. Vehicles pushed by electric cars use the motor as a generator when the usage of regenerative braking and its output is supplied to an electrical load. The switch of electricity to the load affords the braking impact and regenerates energy.

**Keywords:** Regenerative Braking, Generator, Brake pad, Energy Recovery, Flywheel.

### 1. INTRODUCTION

Due to the absence of reliable energy sources; improving economy and lowering exhaust gas emissions have come to dominate modern vehicle studies in recent years. Commercial vehicles, such as garbage trucks and delivery vehicles, lose a significant amount of kinetic energy during routine braking and constant force at low speeds on particular city routes, resulting in better fuel consumption and Green House Emission Gas (GHG) emission than other on-street vehicles. There have been several attempts to improve vehicle shape. Exhaust Gas Recirculation (EGR) and Diesel Particulate Filter (DPF) technology combined is one of the most efficient ways to reduce vehicle emissions, especially for NOx and soot. However, this approach isn't always able to reduce the GHG emission since the low temperature combustion of this era results in increasing the gas penalty. Sacrificing engine performance in exchange for reduced pollutants cannot fundamentally resolve the energy crisis. In order to gain overall GHG reduction objectives, a robust reduction is wanted especially for commercial motors.

Regenerative strength era is one of the key features of electrified vehicles. It lets in the vehicle to seize a exquisite amount of the kinetic energy misplaced in the course of braking or decelerating for reuse. That is pronouncing, power recovery generation can appreciably convey down the energy intake of electrified car, specifically in city operated route. Generally, there are regenerative energy approaches that have been carried out to business vehicles: Regenerative Braking System and Boost Recuperation System. The former is typically

## EFFECTIVE PROGRAMMABLE ROBOTS THAT CARRIES THE HUMAN INTERVENTIONS

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All family members are now preoccupied with their jobs, making it difficult for them to find the time to clean the house. The cleaning machine aids in sweeping and mopping the floor. By merely flipping a switch, the robot completes the task. Additionally, less manpower is required to clean the floors in factories as a result. Due to the aforementioned circumstances, an autonomous cleaning and mopping robot that completes all cleaning and mopping tasks with the push of a button was designed and developed. Through the use of a mobile Bluetooth device, this robot may be manually controlled. The project's primary goal is to make it inexpensive and appropriate for Indian consumers and companies. The development of the robot starts with the design of a simple and most effective chassis for the robot which is a very important part as it has to carry all the weight on the robot. The electronics part where, the type of motor and its specification that should be used to run the bot, the sensors to be used, the microcontroller, the motor drivers, the wheels and other electronic components to be used on the robot are decided. Further, the assembling of the components will be done and finally testing and calibrating the device. A robot which is capable of efficient dust cleaning and moping of the floor of a given room is the main aim of the robot. It is aimed to make the robot economic and feasible for the economic class society. The target time of operation of the robot is one hour. The developed robot will be useful for the household application and industries. This helps to keep the work space and house clean without the physical labor. Also the device will clean the room with a single switch of button. Automatic floor cleaner is an automated machine that facilitates the user to keep their place clean and hygienic. Many industries are working in the automation field to make autonomous cleaners. This paper deals with the development of automatic floor cleaner. Now a day's major emphasis is given on the field of robotics for decreasing human efforts.

**Keyword:** Cleaning Robot, Mopping Robot, Automatic Robot.

### INTRODUCTION

Robots are programmed devices that can do complicated jobs with little assistance from humans. Robots are used in a wide range of fields, including domestic tasks. The number of household robots has increased. Robotic vacuum cleaners are particularly well-known. Only a few of the many robots that exist in the world can be utilized specifically to do man's household duties. The cleaning and mopping robot is one particular type of robot among those that is highly useful for everyone. Cleaning robots are basic automated machines that employ prefixed algorithms and programme to clean the designated area. This robot's primary purpose is to minimize the need for human engagement during the cleaning process, which may be a time taking process. These robots can be used anywhere i.e., in offices, houses, industries etc. These robots can be activated with the press of a single button or can be pre-set to activate at a particular time. There are many successful products in the market. The leading products are IRobot Roomba, Riming Smart Vacuum Cleaners Intelligent Automatic Sweeping Clean Robots, Excipient Ready Maid Robotic Vacuum Cleaner and many more. For cleaning the houses, offices, streets, industries we mostly use the broom. But by using broom some health issue can occur like skin disease, back pain etc. It also requires more mankind power and time. Hence now in present days as technology is growing in every field, we also use robots for cleaning purpose. But cleaning robots are very costly and only some of them give facility of dry cleaning as well as wet cleaning. In India for houses cleaning

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## PROGRESSION PARAMETER OPTIMIZATION FOR A PCM-BASED SYSTEM FOR THERMAL ENERGY STORAGE

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### ABSTRACT

Modern technology stands to benefit greatly from recent advancements in thermal energy storage systems, which have a variety of uses, including space heating, water heating, the use of waste heat, cooling, and air conditioning. Thermal energy storage (TES) systems provide a range of choices. Phase change materials (PCMs) for TES are substances that control thermal energy by absorbing and releasing heat from the medium at specific phase change temperatures. Phase change materials (PCMs) are more frequently employed to store heat as latent heat since they can store a lot of thermal energy in a little amount of area. Beeswax is employed as a phase-change material in the current experimental study's thermal energy storage device to store heat as both sensible and latent heat. Aluminum is doped into beeswax because organic PCMs have poor thermal conductivity. The thermal energy storage system receives heat transfer fluid that is heated continuously from a heat source. A glass round-bottom flask with a phase-change substance inside is used in the thermal energy storage (TES) system. The heat transfer fluid used in the current work is water. While creating the experimental design, parameters like flow rate, heat transfer fluid inlet temperature, and weight of PCM with nanoparticles are taken into account at several levels. Using Taguchi analysis as a guide, experiments are run, and results are logged. Analyzing experimental data allows for the study of the impact of the parameters under consideration on the thermal energy storage system. To determine the ideal HTF inlet temperature, flow rate, and weight of pcm, the data is further examined using Desirability Function Analysis (DFA). The use of only organic materials as PCM and the combination of organic and metallic materials (aluminium powder) are compared.

**Key Words:** Phase change material, Taguchi analysis, Thermal energy storage, Desirability function analysis.

### 1. INTRODUCTION

Due to their high storage density and low temperature change between storage and retrieval in a range of applications, phase change materials have been used in thermal energy storage systems. The use of PCMs in the food business, for medical purposes, for waste heat recovery, for cool suits, for cold storage, and for heating and cooling of buildings, electronic devices, automobile engines, and spaceships are just a few examples of the many different uses that may be made of PCMs. One notable use is solar thermal [1].

Sensible TES devices alter the temperature of the storage medium, which might be water, brine, rock, soil, etc., to store energy. Phase transition is used to store energy in latent TES systems, such as those that employ water or ice to store cold and beeswax to store heat, respectively [2].

In this study, the working fluid consistency of a pcms, popularly known as a PCM, was tested utilizing a number of different criteria. These elements included the transition length, the temperature range, and the dispersion of the metal interface. The ability to store energy not only helps to correct the imbalance between market forces, but it also increases the efficiency and dependability of generators and is an essential part of energy conservation.[3].

By lowering energy waste and capital costs, it results in the saving of premium fuels and increases the system's

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## AN INVESTIGATIVE ANALYSIS ON DESIGNING AND PRODUCTION OF A COOLING LOOP

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The produced heat from the different electronic device components has to be dissipated from them in order to enhance the reliability and efficiency of the devices. In order to maintain lower operating temperatures, a thermal management system with high heat flux removal technologies has been widely created and deployed. First, it has been suggested to use air as the coolant in the cooling system, which is now the most popular choice, and to discover research projects that would improve its effectiveness. However, the coolant running through the systems and rising heat generating densities at the electronic devices restrict the coolant's ability to remove heat. Because of this, interest in the liquid cooling system is increasing.

**Keywords-** Heat Sink, Microchannel Heat Sink, Nanofluid.

### INTRODUCTION

According to their conceivably superior heat transmission properties, it was revealed that aqueous CNT nanofluids were the most promising coolant among the other nanofluids. At higher power densities of 275W, the highest temperature difference for 0.1vol% aqueous CNT nanofluids was discovered to be 24°C [78]. For the same, it was discovered that the improvement in "h" was 57% as compared to the basefluid. However, as processor speeds improve, there is still a need for cooling, and it was predicted that by 2020, the power density will be roughly 360W. Therefore, it is essential to select a coolant that performs better than the current fluid for cooling electronics chips while maximising a number of factors, including size reduction, temperature difference, increasing operational time, increasing speed, cost of the coolant etc. Studies revealed that the micro channels operated with nanofluids serves as a better promising technology for the cooling of electronics in the upcoming generations increasing the performance of electronics. Extensive studies are to be made for choosing the best nanofluids on the electronics cooling for commercial scale applications in all the industrial sectors

### LITERATUREREVIEW

Arabpour A et al. Thermal resistance decreases on increasing the volume fraction and slip velocity coefficient. Heat transfer increases with Reynolds number and volume concentration of nanoparticle . Increasing in volume fraction has increased the friction coefficient due to enhancement in viscosity and density. Tran N et al, • Thermal resistance was improved up to 6.7% when using TiO<sub>2</sub> with 1.0vol.% compare to DI water. Thermal resistance for TiO<sub>2</sub> with 1.0vol.% is lower than Al<sub>2</sub>O<sub>3</sub> with same concentration and DI water The higher thermal performance could be achieved with the nanofluid that have higher thermal conductivity and concentration. Sarafraz et al. • Optimum concentration of silver nanofluid (0.05wt.%) has enhanced the overall thermal performance up 37% at the Reynolds number of 1400 • Silver nanofluid with 0.1wt.% has increased the heat transfer coefficient by 47% and it exhibit the highest one. Abdollahi et al No significant effect on pressure drop by using nanofluid in interrupted MCHS. At least 2.0vol.% is required to obtained an enhancement in heat



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### LITERATUREREVIEW

Arabpour A et al. Thermal resistance decreases on increasing the volume fraction and slip velocity coefficient. Heat transfer increases with Reynolds number and volume concentration of nanoparticle. Increasing in volume fraction has increased the friction coefficient due to enhancement in viscosity and density. Tran N et al, • Thermal resistance was improved up to 6.7% when using TiO<sub>2</sub> with 1.0vol.% compare to DI water. Thermal resistance for TiO<sub>2</sub> with 1.0vol.% is lower than Al<sub>2</sub>O<sub>3</sub> with same concentration and DI water The higher thermal performance could be achieved with the nanofluid that have higher thermal conductivity and concentration. Sarafraz et al. • Optimum concentration of silver nanofluid (0.05wt.%) has enhanced the overall thermal performance up 37% at the Reynolds number of 1400 • Silver nanofluid with 0.1wt.% has increased the heat transfer coefficient by 47% and it exhibit the highest one. Abdollahi et al No significant effect on pressure drop by using nanofluid in interrupted MCHS. At least 2.0vol.% is required to obtained an enhancement in heat

## THE ENLARGEMENT OF A MULTI-NOZZLE PESTICIDE SPRAYER PUMP FOR MAXIMUM RATE AND TIME

<sup>1</sup>M.surendar, <sup>2</sup>Durgaprasad Rapolu, <sup>3</sup>G Babu <sup>4</sup>G Paramesh

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And Research, Hyderabad

### ABSTRACT

India is an agricultural nation with small, marginal, medium, and large farmers. Because of its adaptability, price, and design, small-scale farmers are highly interested in manually labor driven knapsack sprayers. However, this sprayer has certain limitations, including the inability to maintain the necessary pressure and the potential for back and foot pain. However, this technology can also result in incorrect chemical use and inefficient pest management, which causes pesticides to be lost during application owing to drift. This phenomenon raises industrial costs, pollutes the environment, and upsets the natural eco-system. The model of manually driven multinozzle pesticide sprayer pump suggested in this research would conduct spraying at the greatest rate in the shortest amount of time.

**Keywords:** Nozzle, Pump, Solar panel, Battery

### INTRODUCTION

This initiative was developed to address the issue of farmers' use of outdated and ineffective spraying techniques. In India, 60 to 70 percent of farmers employ the "Backpack Knapsack" Fertilizer Sprayer. They must carry it on their backs before manually cranking it. High pressure can't be produced by these pumps. This might result in the spray missing a lot of plants. due to the fact that there is only one nozzle and the operator must move the nozzle over each and every plant. 2 to 3 acres may be covered by one person in a single day. Because of the needed work and constant cranking, the operator's hand suffers greatly. He also needs to balance himself with the weight of the sprayer and Pesticides. In muddy area it's difficult to maintain balance as, operator can slip in muddy areas. Our solution tries to solve above issues so that efforts of farmer gets reduced and time is also saved. We have used manual operate our product.

In India, agriculture and agriculture-based products have received great importance in the Indian economy. The 2010 world statistics of agriculture says, India to be the world's highest producer of several vegetables, fresh fruits, major spices, milk and also some fibrous crops. Lack of mechanization or automation is one of the major roadblocks to improving the productivity of agriculture. With agriculture facing a shortage of manpower, the need for automating the various activities in the field arises or it is becoming the need of the day. With this in mind, a simple machine has been designed and fabricated for removal of pest and unwanted plants between the rows of sugarcane plants. As the sprayer is portable, it is hanged at the shoulder and pesticides are sprayed by the farmer.

A pest is usually characterized by rapid growth and It typically replaces another more desirable disease. Some pests, such as crabgrass, are considered weeds everywhere they grow, but many plants are considered pests in some regions and not in others. Although most pest damage cultivated plants by competing with them for sunlight, water, mineral nutrients, some pest are parasites that infect directly on other plants and thus either weaken or kill them. Many pests are also hosts for disease- causing organisms. For example, some of the fungi diseases that infect food crops spend part of their life cycle on a pest that typically grows near the crop. In addition to harming cultivated plants, many pests, such as Canada thistle, can poison livestock if eaten. Although

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## DEVELOPMENT OF HEALTH CARE SYSTEM USING TTS ASSISTIVE TECHNOLOGY FOR PHYSICALLY CHALLENGED PEOPLE

<sup>1</sup>M.Varasundar, <sup>2</sup>S.Ashok, <sup>3</sup>P.Seetaramaiah, <sup>4</sup>T.Priyanka  
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### ABSTRACT

The Physical disorders affect a child's life almost in every aspect. Speech is the most natural means of information exchange between humans and if a child couldn't meet the expected timeline to express using speech or movement then these disorders can be extended into adulthood as well. Over the years, Attempts have been made to develop vocally interactive computers to realise speech synthesis. Such an interface would yield great benefits to physical disordered people. In order to overcome this problem, TTS Assistive Technology is used which can be modelled using RNN (Recurrent Neural Network). Long short-term memory recurrent neural networks (LSTM-RNNs) have been applied to various speech applications including acoustic modelling for statistical parametric speech synthesis.

**Keywords:** TTS Technology, Statistical Parametric Speech Synthesis ,Neural Network, Long short-term memory.

### I.INTRODUCTION

The infirmities like Amyotrophic Lateral Sclerosis, dumb and paralysis in the people cannot express their views or ideas through speech. As all the voluntary muscles get affected, they lose their strength and the ability to talk , eat, move and even breathe. The cause of this infirmities is unknown. In the world's population about 15-20 percent has some form of language-based learning disability .

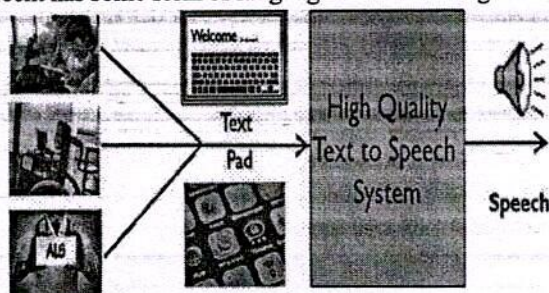


Fig.1: Block Diagram of TTS system

The text is given as an input by this disordered people through keyboard or text pad. It produces the Speech as an output using this TTS Technology .In order to overcome the disability to communicate, we developed a TTS system.

### TTS SYSTEM



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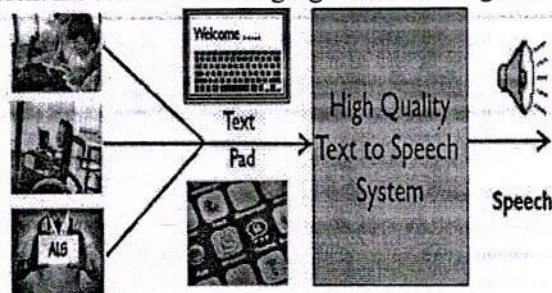


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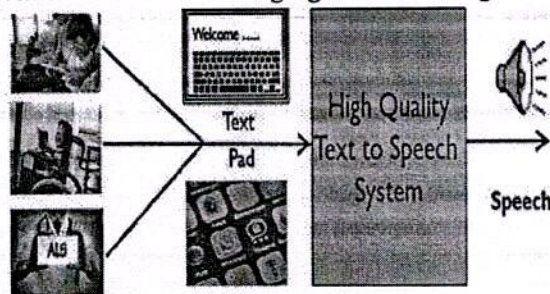


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## UNDERWATER IMAGE ENHANCEMENT USING BRIGHTNESS PRESERVING BI-HISTOGRAM EQUALIZATION AND CLAHE

<sup>1</sup>K.Chalapathi, <sup>2</sup>L.Vishnu Vardhan, <sup>3</sup>L.Rakesh, <sup>4</sup>C.Sindhu

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### ABSTRACT

In this paper, we introduce an effective fashion to enhance the images captured aquatic and degraded due to the medium scattering and absorption. Our system is a single image approach that doesn't bear technical tackle or knowledge about the aquatic conditions or scene structure. It builds on the blending of two images that are directly deduced from a color compensated and white-balanced interpretation of the original degraded image. The two images to fusion, as well as their associated weight charts, are defined to promote the transfer of edges and color contrast to the output image. The images captured in hazy aquatic conditions suffer from poor contrast and low visibility. Hence there's a need for the improvement of imaging data from aquatic disquisition and examination exertion so that it can be analyzed to prize the asked information. In this paper, a new contrast improvement fashion is proposed called 'Brightness Preserving Bi- Histogram Equalization' (BBHE). CLAHE plays a significant part in the luminance improvement of aquatic images.

**Keywords:** Scattering, absorption, color contrast, BBHE, CLAHE

### INTRODUCTION

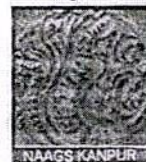
Underwater image processing is one of the major areas in Digital image processing which is applied in various fields. Such as marine habitats monitoring. It also simplifies inspection of piping in the field of engineering. Because of the physical properties of underwater environment, underwater imaging is very not easy field. Mainly related to diffusion and absorption of light. Mainly due to poor visibility conditions and effects such as light absorption, light reflection, bending and scattering of light underwater images lose contrast and suffer from degradation.

### DIGITAL IMAGE PROCESSING

Digital image processing is an advanced technology that enables you to manipulate digital images through computer software. It's the subfield of signal processing, which focuses primarily on images. Digital image processing allows the stoner to take the digital image as an input and perform the different algorithms on it to induce an affair. These algorithms may vary from image to image according to the asked for a fair image.

### IMAGE ENHANCEMENT

Some of the most introductory types of image improvement tools simply change the discrepancy or brilliance of an image or manipulate the gray scale or the red-green-blue color patterns of an image. Some types of introductory pollutants also allow changing a color image to black and white, or a



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The objective of image fusion is to fuse data from multiple pictures into a single image that ideally contains all the vital options from every of the first pictures. As <sup>1</sup>the Depth-of-field of the imaging system is restricted, the extraction of all the helpful data is difficult from one image. In digital photography, the pictures with completely different focuses are combined using a generative adversarial network is called Multi Focus Fusion (MFF-GAN), to attenuate the Defocus Spread Effect (DSE) by generating focus maps during which the foreground region is properly larger than corresponding objects. In this model, an adaptive decision block is introduced to work out whether source pixels are focused or not based on the distinction of repeated blur. Our methodology realizes multi-focus image fusion by extracting and reconstructing data, and thus there's nearly no blurring and detail loss close to the border line. Deep learning ways are the trendy methods that exploit focused and explicit images. Deep learning is utilized in numerous applications like Multi Focus Image Fusion.

**Keywords:** Deep Learning, Generative Adversarial Network, Multi Focus Image fusion.

### 1. INTRODUCTION

Multi Focus Fusion is a technique that combines pair of images into a single image by focusing detail textures in the images. It extracts the essential features of more than a couple of images into an individual fused image without taking any artifacts. Multi-focus image fusion plays a key role in fusion process where it aims to increase the depth of field using extracting focused part from different multiple focused images. The methods that are used in the multi focus fusion are divided into two methods, spatial domain method and frequency domain method. The spatial technique deals with pixel values of the input pictures within which the pixels values are manipulated to realize an acceptable outcome. This domain contains fusion strategies like Weighted Averaging, Selective Maximum Method. The weighted averaging assigns weights to each pixel in the source pictures, and the resultant image is weighted sum of every pixel value. The Selective Maximum Method selects the pixels values of high intensity from pictures to yield fused image. In frequency domain strategies the image is first transferred in to frequency domain, which suggests that the fourier transform of the image is computed first. The Inverse Fourier transform is performed as all the fusion operations are performed on the fourier transform of the image. This domain contains strategies like Wavelet Base Methodology, Discrete Wavelet Transforms.

In this paper we tend to propose a Generative Adversarial Network (GAN) architecture. Generative modelling is an unsupervised learning task in machine learning, the main goal of GANs is to learn from a



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### ABSTRACT

The objective of image fusion is to fuse data from multiple pictures into a single image that ideally contains all the vital options from every of the first pictures. As the Depth-of-field of the imaging system is restricted, the extraction of all the helpful data is difficult from one image. In digital photography, the pictures with completely different focuses are combined using a generative adversarial network is called Multi Focus Fusion (MFF-GAN), to attenuate the Defocus Spread Effect (DSE) by generating focus maps during which the foreground region is properly larger than corresponding objects. In this model, an adaptive decision block is introduced to work out whether source pixels are focused or not based on the distinction of repeated blur. Our methodology realizes multi-focus image fusion by extracting and reconstructing data, and thus there's nearly no blurring and detail loss close to the border line. Deep learning ways are the trendy methods that exploit focused and explicit images. Deep learning is utilized in numerous applications like Multi Focus Image Fusion.

**Keywords:** Deep Learning, Generative Adversarial Network, Multi Focus Image fusion.

### 1. INTRODUCTION

Multi Focus Fusion is a technique that combines pair of images into a single image by focusing detail textures in the images. It extracts the essential features of more than a couple of images into an individual fused image without taking any artifacts. Multi-focus image fusion plays a key role in fusion process where it aims to increase the depth of field using extracting focused part from different multiple focused images.

The methods that are used in the multi focus fusion are divided into two methods, spatial domain method and frequency domain method. The spatial technique deals with pixel values of the input pictures within which the pixels values are manipulated to realize an acceptable outcome. This domain contains fusion strategies like Weighted Averaging, Selective Maximum Method. The weighted averaging assigns weights to each pixel in the source pictures, and the resultant image is weighted sum of every pixel value. The Selective Maximum Method selects the pixels values of high intensity from pictures to yield fused image. In frequency domain strategies the image is first transferred in to frequency domain, which suggests that the fourier transform of the image is computed first. The Inverse Fourier transform is performed as all the fusion operations are performed on the fourier transform of the image. This domain contains strategies like Wavelet Base Methodology, Discrete Wavelet Transforms.

In this paper we tend to propose a Generative Adversarial Network (GAN) architecture. Generative modelling is an unsupervised learning task in machine learning, the main goal of GANs is to learn from a

## DESIGN OF LOW POWER DELAY PRODUCT SRAM CELL USING REVERSIBLE GATES

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### ABSTRACT

The use of electronics in different fields has risen in recent years, necessitating more memory for storing and processing data. Because of its fast speed, SRAM is used in this type of application. SRAM aids in data quality access. SRAM is really important. Each bit is stored in a latching circuit, which serves as a cache memory in the devices. Cache memory operates at a high pace and consumes a lot of power. Devices that consume less power and operate at a rapid pace are required by current technology.

When you use a lot of memory, you use a lot of electricity. For memory cells, several SRAM factors, including as speed and power, must be enhanced. This necessitates the use of SRAM in conjunction with modern technology. The reversible logic gates were implemented and compared for power and delay. The low power reversible logic gates were used to propose a SRAM cell which has lower PDP. All the designs were implemented in 16nm technology using Hspice tool.

**Keywords:** 16 nm CMOS technology, Delay, Power consumption, Reversible logic, High Speed, SRAM.

### 1. INTRODUCTION

Since the 1960s, reversible gates have been studied. Reversible gates dissipate less heat, which was the original motivation (or, in principle, no heat). If we consider a logic gate to be consuming its input, information is lost because the output contains less information than the input. Because of thermodynamic entropy (Landauer's principle), this loss of information loses energy to the surrounding area as heat. Another way to think about it is that when charges in a circuit are grounded, they flow away, carrying a small amount of energy with them. A reversible gate only switches states, and because no information is lost, energy is conserved.

Reversible logic has received a lot of attention in recent years because of its ability to reduce power dissipation, which is a key requirement in low power VLSI design. It has numerous applications in low-power CMOS and optical data processing, DNA computing, quantum computation, and nanotechnology. Irreversible hardware computation wastes energy due to information loss. According to Landauer's research, every irreversible bit operation dissipates at least  $KT \ln 2$  joules, where  $K=1.3806505 \times 10^{-23} \text{m}^2 \text{kg}^{-2} \text{K}^{-1}$  (joule/Kelvin-1) is the Boltzmann's constant and  $T$  is the temperature at which the operation is performed. At room temperature, the heat generated by the loss of one bit of information is very small; however, when the number of bits increases, as in the case of high-speed data transmission, the heat generated increases dramatically.

Sithara Raveendran and Y.B. Nit hin Kumar proposed inexact signed Wallace tree multiplier design using reversible logic. In this 4:2 compressor is proposed using reversible logic gates which is able to reduce reversible logic realization metrics like garbage outputs, gate count, quantum cost [1].

M. Kiran Kumar and M. Shanthi designed new gates called KS, KIRS, KIRANTHI which are formed from the garbage outputs of reversible gates in efficient way [2].

Reversible system design for CMOS circuits with perfect or 100% Concurrent Error Detection (CED) capability has been proposed by Sajjad Parvin and Mustafa Altun. They presented Even Target - Mixed Polarity Multiple Control Toffoli as a new fault-preservative reversible gate library for this purpose (ET-

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## SEGMENTATION AND DETECTION OF BRAIN TUMOR USING FCM THRESHOLDING TECHNIQUE

<sup>1</sup>L.Vishnu Vardhan, <sup>2</sup>A.Madhu, <sup>3</sup>M.Madhava Rao, <sup>4</sup>Korvi Vignesh

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### ABSTRACT

Brain tumor is one of the major threats confronted by many people around the world. Brain tumors are one of the dangerous diseases that leads to a maximum number of deaths. Meningioma is the most common diseases observes more than 30% of all brain tumors. Here, our main aim is to extract tumor in the brain using clustering technique. Separation of abnormal brain tissues from normal tissues of brain is very difficult to detect the tumor. So, image segmentation is performed on the brain MRI image. Based on the pixel intensities of the image, k-means clustering technique separates the tumor from the surrounding brain tissue. Similarly FCM Thresholding also extracts the features from the skull free image. This results in high precision and accuracy of 99.49% and 93.93% respectively using FCM Thresholding compared to others.

**Keywords** – Meningioma, Thresholding, Morphological Operation, K-means clustering, Fuzzy C-Means, FCM Thresholding.

### 1. INTRODUCTION:

In medical imaging, segmentation of tissues and structures plays a major role in many image analysis applications developed for medical diagnosis. Brain tumor is one of the major causes for increasing mortality among children and adults. Brain tumors can be separated into two general categories depending on the tumors origin, their growth pattern and malignancy. There are many types of different tumors such as brain, chest and spinal cord, etc which can appear in human body. Brain tumor occurs when group of abnormal cells form within the brain. There are two main types of tumors malignant or cancerous tumors and benign tumors. Malignant tumor involves abnormal cell growth with the potential that spread to other parts of the body. Benign tumors do not spread to other parts of the body. Basically, the tumor is detected using medical devices with techniques such as Positron Emission Tomography (PET), Computed Tomography (CT), Magnetic Resonance Imaging (MRI), Ultrasonic, in which it may be benign (non-cancer) or malignant (cancer). Image segmentation helps in diagnosis of brain diseases and helps in qualitative analysis and quantitative analysis of MR images such as measuring accurate size and volume of extracted portion. Exact measurements in brain diagnosis are difficult because of different shapes and sizes of tumor. Detection of brain tumors is very essential in earlier stages.

Segmentation is an important stage of the image recognition system, because it extracts the objects of our interest, for further processing and recognition of the tumor. Segmentation techniques are used to

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## RF ENERGY HARVESTING PENTAGONAL MICROSTRIP PATCH ANTENNA DESIGN USING HFSS SOFTWARE

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### ABSTRACT

Micro strip antennas are used in wireless communication. The main end of this design is to design a pentagonal microstrip patch antenna for RF energy harvesting having high gain. ANSYS HFSS software is the assiduity standard for bluffing 3-D, full surge, electromagnetic fields. Its gold standard delicacy, advanced solvers and high-performance computing technologies make it an essential for masterminds. The antenna operates at a frequency of 2.4MHz. The proposed design is delved through radiation patterns, S-parameters and gain attained in HFSS software.

**Keywords**— Microstrip antenna, Radio frequency ranges, gain, omni directional.

### INTRODUCTION

In recent times, the importance of wireless technology has been improved. The developments in this wireless technology directed to raising demand for self-powered providing power to low-energy electronics [1]. Energy harvesting is known as power harvesting. In this process energy is obtained from the external source like wind energy, thermal energy stored for devices. This energy converted into electricity to feed the low power devices.

Now-a-days RF energy has gained more attention. To develop this energy harvesting technology many developments are introduced [2]. This technology decreases the cost of devices. The main device is rectenna. This rectenna device consists of antenna impedance, matching networks, rectifier circuits, storage elements and a load network. Antenna is used to collect the radio frequency energy from all towers. This energy is transferred to rectifiers. Rectifier converts the continuous signal into DC signal. To provide better impedance matching networks are used.

Since many research have been performed to design an antenna in order to get high gain and better radiation performance.

In this paper microstrip antenna in pentagonal shape is proposed.

Micro strip antenna is fabricated using a microstrip technique on a printed circuit board (PCB). So, another name for microstrip antenna is printed antenna. They work at microwave frequencies. Microstrip antenna has become very common popular due to their low profile.

The most common form of micro strip antenna is patch antenna. Square, rectangular, circular, pentagonal microstrip antennas are most common.

Microstrip antennas find applications in many communication systems, partially where the small size of antennas is key requirements. Patch antennas are assigned different name such as printed antennas, microstrip patch antennas or simply microstrip antenna.

### I. DESIGNING PROCEDURE

This section deals with the geometric design parameters of pentagonal microstrip antenna. This pentagonal microstrip patch antenna is operating at frequency of 2.4GHz [1]. The pentagonal patch antenna has been designed using the substrate Diclad – 870 with the dimensions 100 x 100 x 1.6 and a relative dielectric constant equal to  $\epsilon_r = 2.33$  and height of substrate (h) = 1.5 mm [1]. The pentagonal patch is fed with a

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The Intensity In homogeneity frequently occurs in real-time images, which presents a reasonable challenge in the image segmentation. The most widely used image segmentation algorithms are region-based and typically rely on the homogeneity of the image intensities in the regions of interest (ROI), which frequently fail to provide exact segmentation results due to the intensity In homogeneity. This proposes a novel region-based method for image segmentation, which is able to deal with Intensity In homogeneities in the segmentation. First, based on the model of images with intensity In homogeneities, we derive an local intensity clustering property of the image intensities and define local clustering criterion function for the image intensities in the neighbourhood of each point. This local clustering criterion function is then integrated with respect to the neighbourhood centre to give an global criterion of image segmentation. In a level set formulation, this criterion defines an energy in terms of the level set functions that represent a partition of the image domain and a bias field that accounts for Intensity In homogeneity of the image. Therefore, by minimizing this energy and using level set method, our method is able to simultaneously segment the image and estimate the bias field, and the estimated bias field can be used for intensity In homogeneity correction using Additive bias correction. Our method has been validated on the synthetic images and the real images of various modalities, with an desirable performance in the presence of the intensity In homogeneities. Experiments proved that our method is more robust to initialization, faster and more accurate than the well-known piecewise smooth model. As an application, our method has been used for segmentation and bias correction of the images with promising results.

**Keywords:** Intensity in homogeneity, local clustering criterion, level set functions, bias field, magnetic resonance (MR) images

### 1. INTRODUCTION

In image processing, Image Segmentation is the process of segmenting a image into number of image segments is known as image regions . The Main goal of Image Segmentation is to extract the interested area without any undesired area like bias field. However to extract that one of the Fundamental Challenges in the field of image processing and computer vision is Intensity In homogeneity .High segmentation speed and less runtime, less sensitive to noise are the present requirements in the image segmentation process in Image processing ,Level set method can be effectively used to solve problems during the evolution of curves for that Additive Bias correction method is one of the bias correction techniques which is more efficient.

#### 1.1 HISTORICAL BACKGROUND

In the time 2018, Author Weng Guirong, Ding Keyan Proposed Active silhouettes driven by original pre-fitting energy for fast image segmentation which is robust to initialization and also can denoise the images, still there's a limitation that it cannot prize the image impeccably due to bias field. In the time 2019, Author Ri Jin, Guirong Weng proposed A robust active figure model driven by pre-fitting bias correction and optimized fuzzy c- means algorithm for fast image Segmentation in which this model bias correction is performed with fast image segmentation, still there's a limitation that this Model can not perform well in the



## ADDITIVE BIAS CORRECTION FOR IMAGE SEGMENTATION USING INTENSITY IN HOMOGENEITY SEGMENTATION ALGORITHM

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# Performance of energy-efficient cooperative cognitive radio system over erroneous Nakagami- $m$ and Weibull fading channels

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## Abstract

Cognitive radio (CR) is developed as one of the important techniques to improve the utilization of the radio spectrum. A CR node shares the radio spectrum with a licensed primary user opportunistically. In this paper, we study the performance of an energy-efficient cooperative cognitive radio system (CCRS) in the presence of noise plus different fading conditions under channel error constraints. Two fading environments namely, Nakagami- $m$  and Weibull fading are considered and performance characteristics are evaluated. More precisely, Every CR node uses the similar energy detectors to sense a primary user, and forwards their knowledge to fusion center (FC) as one bit binary information. Different hard-decision fusion operations are carried out at FC to take the global decision about the status of the primary user. The analytical and simulation models related to noise and fading for calculating missdetection performance, total error performance, and sensing time and throughput/energy efficiency trade-off are developed. Analytical frameworks are validated via computer based simulations. For comparison purposes, we also investigate the performance of CCRS in Rayleigh fading with and without channel errors constraints. Further, the performance CCRS is investigated for various hard-decision fusion rules under several parameters of the system. Finally, an optimal values of the number of CR nodes and sensing threshold for different fusion rules, and sub-optimal hard-decision fusion rule are also investigated. The energy efficiency is enhanced by 19% when CCRS is operated over Nakagami- $m$  fading environment as compared to Rayleigh fading environment for a fixed parameter values of the network.

**Keywords** Cognitive radio · Channel error · Fading models · Total error probability · Throughput · Energy efficiency

## 1 Introduction

Cognitive radio (CR) technology is developed to alleviate the conflicts between spectrum scarcity and poor utilization of the primary users (PUs). In CR networks, the CR users are unlicensed and can access the spectrum of PUs without creating any harmful interferences. Moreover, this technology supports many emerging wireless applications such as TV bands for smart grid, broadband cellular, military and public safety [1, 2]. Both the CR network and 5th generation (5G) cellular network are going to be the next generation technologies. The CR network incorporates both radio and networking technologies to present effective utilization of radio spectrum [3, 4]. On the other hand, the CR network detects the available channels in a wireless spectrum automatically and also improves the utilization efficiency of the wireless spectrum [5]. Specific and

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## IDENTIFICATION AND DETECTION OF TUBERCULOSIS IN CHEST X-RAY IMAGES APPLYING DEEP LEARNING TECHNIQUES

<sup>1</sup>Dr.P.Satish Reddy, <sup>2</sup>D.Uma, <sup>3</sup>A.Vijay Kumar, <sup>4</sup>Palugula Preethi

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### Abstract

One of the top ten most ground-breaking data analysis technologies is deep learning. Deep learning can be used to learn data representations that have multiple levels of abstraction. Deep learning has the greatest benefits for visual object detection. The identification of tuberculosis (TB) in X-ray images may be resolved utilizing deep learning. These new instruments might improve TB diagnosis and treatment for radiologists, who are in short supply. Three deep learning-based software systems have been used to find anomalies in chest X-rays: CAD4TB, qXR, and Lunit INSIGHT (CXRs). The anomalous area is highlighted using a heat map image by the learning-based software from CAD4deep TB. The qXR algorithm may recognize 15 anomalies from abnormal chest X-rays. There are 10 anomalies that may be seen on the chest radiographs using the Lunit INSIGHT CxR programmed. There must be a human observer to verify the usage of deep learning-based computer-aided detection systems (CAD). The receiver operating characteristic (ROC) curve is used to evaluate the accuracy of CAD software. Ethical and scientific standards must be adhered to while using deep learning in medicine.

### 1. Introduction

Effective prevention and control of tuberculosis (TB) depend on early identification of the disease. The high TB prevalence is a result of a number of factors, including poverty, slum overpopulation, poor nutrition, mental health problems, drug use, and HIV infection [1]. The TB detection gap may be getting worse in several nations due to inadequate health care and a lack of CXR readers. Some of the screening techniques used to identify TB include acid-fast bacillus (AFB) tests, sputum cultures, questionnaires, chest X-rays, and tuberculin skin tests (TST). A chest X-ray is advised by the WHO as the initial step in the detection of tuberculosis (TB). Chest radiographs are necessary for the diagnosis of chest diseases. To identify tuberculosis, an X-ray machine, skilled personnel to maintain the machine, and a lack of specificity by observers restricted the role played by X-ray pictures. Computer-



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## ANALYSIS ON USING MACHINE LEARNING AND ARTIFICIAL INTELLIGENCE, AUTOMATING E-GOVERNMENT FEEDBACK SERVICES

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### ABSTRACT

The state of the art has recently increased in an increasing variety of industries thanks to AI. In order to promote e-government systems and improve citizens' interactions with government, there are some obstacles to its widespread implementation in e-government applications. In this paper, we provide a framework that uses artificial intelligence (AI) technology to automate and facilitate e-government services. E-government systems encounter a number of challenges. We'll start by developing a plan for handling data assets and information related to e-government. The development of a collection of deep learning models aimed at automating multiple government tasks comes next. Additionally, we have outlined architecture for an electronic government platform that makes it simple to develop and integrate AI features. With the aim of reducing processing times, cutting costs, and enhancing citizen happiness, we're aiming to upgrade the current status of e-government services by adopting proven AI approaches.

**Key Words** — Artificial Intelligence, Machine Learning, Automation, Convolutional Neural Network, Sentiment Analysis.

### 1. INTRODUCTION

Machine learning (ML) and artificial intelligence (AI) are popular topics right now. This technology enables automated decision-making and reduces the need for human interaction. One way to describe health insurance laws is as government regulations that are enforced for the benefit of the population as a whole. This particular health insurance policy has limitations on their product under the policy. Automated intelligence is a method that turns a comprehensive system of rules into software and a digitally assisted approach. The government is setting up a purportedly nationwide organisation to handle every facet of health insurance. A foundation for the system must include the detection and analysis of various user suggestions and input, including the recognition of both good and bad options. The AI method can be used to all sections of the sectional methods, and their attributed insurance policies can also be considered in this context.

### 2. LITERATURE SURVEY

[2] In, the advancement of the technologies not only MNC's but also governments also started to show interest into the technologies into the applications of the government-based websites, networking and also machine learning to learn from the about the how to solve problems to the common people. They, have



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## A STUDY ON UTILISING CNN TECHNIQUE FOR CORRECTLY DEHAZING EVERY BAND OF MULTISPECTRAL IMAGES UNDER VARIOUS SCENARIOS

<sup>1</sup>Dr. Yadu Singh, <sup>2</sup>CH.Mahesh, <sup>3</sup>A.Vijay Kumar, <sup>4</sup>Mada Maheshwari

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### ABSTRACT

Haze frequently taints multispectral remote sensing photos, resulting in poor image quality. This study proposes a unique dehazing technique for multispectral remote sensing images based on a deep convolutional neural network (CNN) with residual structure. In order to train a regression from the hazy image to the clear image, multiple CNN individuals with the residual structure are first connected in parallel. The ultimate dehazing result is created by combining weight maps and the outputs of CNN individuals. The CNN people in the developed network are trained using various levels of haze samples to obtain various dehazing capacities by mining multi-scale haze characteristics through multi-scale convolutions. The weight maps also adjust to the hazy distribution, and the fusion of the CNN individuals is adaptive. The designed network is end-to-end, and putting a hazy image into it, the clear scene can be restored. To train the network, a wavelength-dependent haze simulation method is proposed to generate labeled data, which can synthesize hazy multispectral images highly close to real conditions. Experimental results show that the proposed method can accurately remove the haze in each band of multispectral images under different scenes.

**Keywords:** Convolutional neural networks, dehazing , Remote sensing images, weight maps , residual structure

### 1. INTRODUCTION

A wealth of ground data may be obtained from multispectral remote sensing pictures, which makes it a vital tool for investigating the earth's resources and natural environment. However, meteorological factors like haze, fog, and cloud often have an impact on multispectral photographs. These occurrences make images less visible and cause texture details to be lost, which presents problems for many applications like terrain categorization and target recognition. Haze removal is therefore required to raise the calibre of remote sensing photographs.

Image dehazing is a method that is becoming more and more popular for dealing with the deterioration of photos of the natural world caused by low visibility weather, dust, and other causes. The demand for low-complexity, high-performing dehazing solutions has increased as a result of developments in autonomous systems and platforms. Outdoor images often suffer from low contrast and limited visibility due to haze, small particles such as dust, mist, and fumes which deflect light from its original course of propagation. Haze has two effects on the image: it weakens the image contrast and also adds an additive component to the image, so-called airlight. Recovering a haze-free image can restore the visibility of the scene and correct the color shift caused by the airlight. Furthermore, dehazing can benefit many computer vision algorithms which



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Image dehazing is a method that is becoming more and more popular for dealing with the deterioration of photos of the natural world caused by low visibility weather, dust, and other causes. The demand for low-complexity, high-performing dehazing solutions has increased as a result of developments in autonomous systems and platforms. Outdoor images often suffer from low contrast and limited visibility due to haze, small particles such as dust, mist, and fumes which deflect light from its original course of propagation. Haze has two effects on the image: it weakens the image contrast and also adds an additive component to the image, so-called airlight. Recovering a haze-free image can restore the visibility of the scene and correct the color shift caused by the airlight. Furthermore, dehazing can benefit many computer vision algorithms which



## A STUDY ON UTILISING CNN TECHNIQUE FOR CORRECTLY DEHAZING EVERY BAND OF MULTISPECTRAL IMAGES UNDER VARIOUS SCENARIOS

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Narayanreddy College Of Engineering And Research, Hyderabad.

### ABSTRACT

Haze frequently taints multispectral remote sensing photos, resulting in poor image quality. This study proposes a unique dehazing technique for multispectral remote sensing images based on a deep convolutional neural network (CNN) with residual structure. In order to train a regression from the hazy image to the clear image, multiple CNN individuals with the residual structure are first connected in parallel. The ultimate dehazing result is created by combining weight maps and the outputs of CNN individuals. The CNN people in the developed network are trained using various levels of haze samples to obtain various dehazing capacities by mining multi-scale haze characteristics through multi-scale convolutions. The weight maps also adjust to the hazy distribution, and the fusion of the CNN individuals is adaptive. The designed network is end-to-end, and putting a hazy image into it, the clear scene can be restored. To train the network, a wavelength-dependent haze simulation method is proposed to generate labeled data, which can synthesize hazy multispectral images highly close to real conditions. Experimental results show that the proposed method can accurately remove the haze in each band of multispectral images under different scenes.

**Keywords:** Convolutional neural networks, dehazing , Remote sensing images, weight maps , residual structure

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## **ANALYSIS ON SPECULATING INFLUENCERS IN SOCIAL NETWORKS USING CASCADING TECHNIQUES**

<sup>1</sup>Asif Ahmed Algur, <sup>2</sup>N.Vasundhara, <sup>3</sup>S.RajenderKumar, <sup>4</sup>Ummenthala Manjula  
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### **ABSTRACT**

Online social networks have given society access to a new kind of communication. Worldwide interaction and communication are made possible by social networking sites like Facebook, Instagram, and Twitter, which connect individuals and ideas from all over the world. There are those who can influence others to their point of view on every social network. Finding a powerful person is crucial because it enables us to spread knowledge more effectively and to a wider audience. In this study, we studied many methodologies to determine which one was best for the network, using information cascade techniques and showcasing the relevant ideas and the topic to the subjects to understand how to use machine learning approaches to identify the network's most influential nodes.

### **I. INTRODUCTION**

In recent years, the role of social networks in our daily lives has grown. We connect with our friends on Facebook, Twitter, and Instagram to share our ideas and experiences. You might notice that some of your friends have more impact than others when you scroll through your friends' postings; these people are known as influencers. Because people frequently adopt their social media beliefs, influencers have a significant impact on other people's lives, according to sociological research. We must therefore identify the influencers and learn how they affect public opinion. Our project's objective is to locate Twitter influencers on a particular social network.

The binary label represents somebody's judgement regarding that one among the 2 people is additional cogent. A label '1' means that A is more influential than B. '0' means B is more influential than A. The goal of the challenge is to coach a machine learning model which, for pairs of individuals, predicts the human judgement on who is more influential with high accuracy.

### **II. LITERATURE SURVEY**

#### **1. "DETECTING INFLUENCERS IN SOCIAL MEDIA DISCUSSIONS" – Sara Rosenthal**

It include a system for predicting who the influencers are in online discussion forums. We provide an evaluation of a rich set of features inspired by social science. Each feature set used to detect influence is complex and computed by a system component. This allows us to provide a detailed analysis as to why the person was chosen as an influencer.

#### **2. "SOCIAL INFLUENCE PREDICTION WITH NEURAL NETWORK LABEL CLASSIFICATION" – Associate of Computer Machinery Publishers**



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## A BREST CANCER DISEASE CLASSIFICATION BY USING OPTIMIZED NEURAL NETWORK

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### ABSTRACT

In this study, we provide a novel convolutional neural network-based method for classifying breast detection cells (CNN). Tumours from breast cancer can be benign or malignant. The correct classification of a breast cancer tumour is essential for medical diagnosis. In this paper, a convolutional neural network (CNN) approach is suggested for the detection of breast cancer. It looks into the suggested method for automatically detecting breast cancer using several convolutional neural network (CNN) architectures. [1] It is a difficult task to diagnose breast cancer in order to improve patient treatment. A recent study suggests using CNN to find and get accurate findings, which may lessen human error in the diagnosis process and lower the cost of cancer detection. [2] Our model recognises a mass region and categorises them into benign or malignant.[3] The performance of the model on test dataset is found to be: detection accuracy 95%, and AUC-ROC of 94%.

**Keywords:** CNN, Benign, Malignant, Resnet50, SVM, LR.

### 1. INTRODUCTION

Breast cancer is a type of cancer that develops in the breast cells and spreads to other parts of the body. Breast cancer is more likely to affect women than men. How a cancer is treated depends on its stage. The term "benign" refers to a class of diseases marked by benign changes to breast tissue. Most benign breast diseases don't raise the chance of breast cancer. Malignant tumors are tumors that have cancer. Malignant cells have the ability to move outside of the primary tumor to other regions of the body if untreated. Breast cancer is a malignant tumor that originated from breast cells.[4]

At some time in her life, one out of every eight women will be diagnosed with breast cancer. Given that there is currently no universally accepted preventive method, early identification and good treatment are the key options for reducing breast cancer mortality. Localized tumors can be successfully treated before the cancer spreads if breast cancer is diagnosed early enough. As a result, accurate breast cancer diagnosis has emerged as a critical and in research area.[5]

Cancer has risen to prominence as a serious public health issue. According to data from the WHO's IARC (International Agency for Research on Cancer) and the GBD (Global Burden of Disease Cancer Collaboration), cancer diagnoses climbed by 28% between 2006 and 2016, with 2.7 million new cases expected by 2030. Breast cancer is one of the most frequent and lethal cancers in women among the numerous types of cancer (1.7 million incident cases, 535,000 deaths, and 14.9 million disability-adjusted life years). As a result, it is crucial to detect breast cancer early. Although X-ray, MRI (Magnetic Resonance





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### ABSTRACT

Diabetes is a disease that develops when the body's glucose levels are too high. Diabetes should not be disregarded; if left untreated, it can result in serious complications for a person, including damage to the eyes, blood pressure, kidneys, heart, and other body organs. If diabetes is identified earlier, it can be managed. By utilizing a variety of machine learning techniques, we will do early diabetes prediction in a human body or patient for a higher degree of accuracy. Approaches for machine learning by building models using patient datasets, you can forecast events more accurately. In this study, we will apply ensemble techniques and machine learning classification on a dataset to predict diabetes. Which are K-Nearest Neighbor (KNN), Logistic Regression (LR), Decision Tree (DT), Support Vector Machine (SVM), Gradient Boosting (GB) and Random Forest (RF). The accuracy is different for every model when compared to other models. The Project work gives the accurate or higher accuracy model shows that the model is capable of predicting diabetes effectively. Our Result shows that Random Forest achieved higher accuracy compared to other machine learning techniques.

**Keywords:** Diabetes, Machine, Learning, Prediction, Dataset, Ensemble

### INTRODUCTION

Diabetes is one of the worst diseases there is. Obesity, a high blood glucose level, and other factors can cause diabetes. It alters the function of the hormone insulin, which causes crabs to have an irregular metabolism and raises blood sugar levels. When the body does not produce enough insulin, diabetes develops. The World Health Organization (WHO) estimates that 422 million people worldwide have diabetes, mostly in low- or middle-income nations. And up until the year 2030, this might be increased to 490 billion. However, diabetes is more common in many nations, including Canada, China, and India, among others. With a current population of over 100 million, India actually has 40 million diabetes patients among the leading causes of death in the world. Early prediction of disease like diabetes can be controlled and save the human life to accomplish this, this work explores prediction of diabetes by taking various attributes related to diabetes disease. For this purpose we use the Pima Indian Diabetes Dataset, we apply various Machine Learning classification and ensemble Techniques to predict diabetes. Machine Learning Is a method that is used to train computers or machines explicitly Various Machine Learning Techniques provide efficient result to collect Knowledge by building various classification and ensemble models from collected dataset. Such collected data can be useful to predict diabetes. Various techniques of Machine Learning can capable to do prediction, however it's tough to choose best technique. Thus for this purpose we apply popular classification and ensemble methods on dataset for prediction.

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## LOCATION-BASED ATTENDANCE MOBILE APP FOR ANDROID WITH 2-WAY FACE RECOGNITION AND OTP AUTHENTICATION

<sup>1</sup>S.Varalakshmi, <sup>2</sup>Chandra Shekar, <sup>3</sup>R.Mrudula, <sup>4</sup>Kanchibhotla Phani Sai Anvesh

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### Abstract

Every manual work has been replaced with an automated technique in today's age of automation and artificial intelligence, yet this requires a lot of precise logic and code to provide error-free output. The need for location-based services has increased along with the popularity of smart phones, portable devices, and contactless technologies. Every location-based information system must be able to provide assistance with the precise information, at the proper location, in real time, with customized setup and location sensitivity. This requires a basic Smartphone with the absolute lowest amount of hardware, and the other tasks can be completed using an application created with client-side requirements. Real-time face recognition is not only a part of the automatic face recognition (AFR) system but also is increasing as an independent research subject, thought it carries less accuracy as compared to other biometric authentication technique like Iris and fingerprint scanners but it is contactless and is non-invasive in nature. The developer in this project aims to provide solution to record and authenticate day to day manual activities of handling on site attendance. The study is based on primary data through questionnaire which was sent to construction managers who maintain the day to day attendance. Simple random sampling form the base of the study, 20 constructions managers are interviewed for the study.

Keywords: Face recognition, face detection, location based attendance, AutoML, OTP, Firebase.

### 1. Introduction

A mobile application that depends on a mobile device's location is known as a location-based service (LBS). To locate the user's mobile device, an LBS application typically needs a positioning component. The majority of LBS services available today don't require users to explicitly enter their position, like supplying a zip code or street name; instead, they automatically record the location based on GPS. Every system in the field of automation and technology must rely on human contact as little as possible. It's crucial to consider the most crucial aspects of any company, such as attendance tracking and calculating working hours. There are typically two sorts of systems available.

**Manual :** Manual system involves the use of sheets of paper or books in taking attendance where employees fill out and managers oversee for accuracy. This method could be erroneous because sheets could be lost or damaged. Also the extraction of relevant data and the manual computation of working time is very time consuming. It takes an extra employee to check for the attendance and timing of other employees which includes cost overhead for the organization as well.

**Automated:** An automated system aims at using technology and devices to record and calculate the attendance like in and out time of an employee etc. and correspondingly calculates the number of days present . This is useful in calculating the salary of the employee.

Today an increasing need is seen for management information system which is considered as the backbone of any large cooperates today . It has increasingly become important that computed data and statistics to be available by the press of a button. However the proposed system aims at

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Every manual work has been replaced with an automated technique in today's age of automation and artificial intelligence, yet this requires a lot of precise logic and code to provide error-free output. The need for location-based services has increased along with the popularity of smart phones, portable devices, and contactless technologies. Every location-based information system must be able to provide assistance with the precise information, at the proper location, in real time, with customized setup and location sensitivity. This requires a basic Smartphone with the absolute lowest amount of hardware, and the other tasks can be completed using an application created with client-side requirements. Real-time face recognition is not only a part of the automatic face recognition (AFR) system but also is increasing as an independent research subject, thought it carries less accuracy as compared to other biometric authentication technique like Iris and fingerprint scanners but it is contactless and is non-invasive in nature. The developer in this project aims to provide solution to record and authenticate day to day manual activities of handling on site attendance. The study is based on primary data through questionnaire which was sent to construction managers who maintain the day to day attendance. Simple random sampling form the base of the study, 20 constructions managers are interviewed for the study.

Keywords: Face recognition, face detection, location based attendance, AutoML, OTP, Firebase.

### 1. Introduction

A mobile application that depends on a mobile device's location is known as a location-based service (LBS). To locate the user's mobile device, an LBS application typically needs a positioning component. The majority of LBS services available today don't require users to explicitly enter their position, like supplying a zip code or street name; instead, they automatically record the location based on GPS. Every system in the field of automation and technology must rely on human contact as little as possible. It's crucial to consider the most crucial aspects of any company, such as attendance tracking and calculating working hours. There are typically two sorts of systems available.

**Manual :** Manual system involves the use of sheets of paper or books in taking attendance where employees fill out and managers oversee for accuracy. This method could be erroneous because sheets could be lost or damaged. Also the extraction of relevant data and the manual computation of working time is very time consuming. It takes an extra employee to check for the attendance and timing of other employees which includes cost overhead for the organization as well.

**Automated:** An automated system aims at using technology and devices to record and calculate the attendance like in and out time of an employee etc. and correspondingly calculates the number of days present . This is useful in calculating the salary of the employee.

Today an increasing need is seen for management information system which is considered as the backbone of any large cooperates today . It has increasingly become important that computed data and statistics to be available by the press of a button. However the proposed system aims at

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<sup>1,2,3</sup> Assistant Professor, <sup>4</sup>UG Student, <sup>1,2,3,4</sup>Department of Computer science and Engineering, Kasireddy  
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# Advanced Gesture Sign Language Conversion to Text and Voice Using Convolution Neural Network (CNN)

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**ABSTRACT:** Sign Language Recognition (SLR) targets on interpreting the sign language into text or speech, to facilitate the communication between deaf-mute people and ordinary people. This task has broad social impact but is still very challenging due to the complexity and large variations in hand actions. Existing methods for SLR use hand-crafted features to describe sign language motion and build classification models based on those features. However, it is difficult to design reliable features to adapt to the large variations of hand gestures. To approach this problem, we propose a novel convolution neural network (CNN) which extracts discriminative spatial-temporal features from raw video stream automatically without any prior knowledge, avoiding designing features. To boost the performance, multi-channels of video streams, including color information, depth clue, and body joint positions, is used as input to the CNN to integrate color, depth and trajectory information. We validate the proposed model on a real dataset collected with Microsoft Kinect and demonstrate its effectiveness over the traditional approaches based on hand-crafted features.

**Keywords:** Gesture, Sign language, CNN, SLR, Voice, Text

## 1. INTRODUCTION

Sign language, as one of the most widely used communication means for hearing-impaired people, is expressed by variations of handshapes, body movement, and even facial expression. Since it is difficult to collaboratively exploit the information from handshapes and body movement trajectory, sign language recognition is still a very challenging task. This paper proposes an effective recognition model to translate sign language into text or speech in order to help the hearing impaired communicate with normal people through sign language. Technically speaking, the main challenge of sign language recognition lies in developing descriptors to express handshapes and motion trajectory. In particular, handshape description involves tracking hand regions in video stream, segmenting hand-shape images from complex background in each frame and gestures recognition problems. Motion trajectory is also related to tracking of the key points and curve

## NICKEL DOPING IMPACT ON SnO<sub>2</sub> THIN FILM'S STRUCTURAL OPTICAL AND MAGNETIC CAPABILITIES FOR SOLAR CELL AND SPINTRONICS APPLICATIONS

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To improve the characteristics of SnO<sub>2</sub> thin films for incorporation into solar cells and in spintronics applications, a comprehensive investigation on the fabrication of pure and Nickel (Ni) doped Tin oxide (SnO<sub>2</sub>) thin films with various doping concentrations has been carried out. By using X-ray diffraction (XRD), scanning electron microscopy (SEM), ultraviolet-visible spectrophotometers, and vibrating sample magnetometers, researchers examined the effects of Ni doping at various concentrations on the structural, optical, and magnetic properties of the various synthesized samples of SnO<sub>2</sub> thin films (VSM). SnO<sub>2</sub> displayed tetragonal structure in all of the Ni-doped samples. The crystal is defective due to the fusing of Ni into the SnO<sub>2</sub> lattice, and the existence of additional peaks demonstrates that the nickel domination is clearly visible. Reduction in the optical band gap was observed with increase of Ni doping levels. The vibrating sample magnetometer measurements revealed that the ferromagnetic signal is progressively enhanced with increase in doping concentration.

**Key Words:** SnO<sub>2</sub> Thin Films, Spray Pyrolysis, Ferromagnetism, Nickel, Doping, Solar Cell, Spintronics.

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## A Semiorganic L-Histidinium Methyl Benzoate NLO Single Crystal's Development and Characterisation

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L-histidine and methyl benzoic acid were used to successfully synthesis a novel semi-organic crystal of L-Histidinium Methyl Benzoate (LHMB), and for the first time, single crystals were grown using the solvent evaporation method. XRD, FTIR, and TG/DTA measurements have been used to evaluate the generated single crystals. Vickers microhardness tests have been used to evaluate its mechanical behaviour. The Kurtz powder method was used to examine its nonlinear optical property, and the results showed that it had a higher SHG efficiency than potassium dihydrogen phosphate single crystal. UV-Vis analysis of its optical properties revealed that the crystal is clear between 240 and 1200 nm. It may thus be quite helpful for Second Harmonic Generation (SHG) applications.

**Key words:** Nonlinear optical crystal solution growth technique, Powder XRD, FTIR, TG/DTA, UV-Vis, Hardness

### 1. Introduction

Modern technology, including lasers, sensors, interferometers, memory chip detectors, electrical appliances, and optical components, heavily relies on nonlinear optical (NLO) crystals. Recently, a lot of work has gone into developing and studying novel nonlinear optical materials with intriguing characteristics as strong laser damage resistance, low UV cutoff, moderate birefringence, and good mechanical strength [1, 2]. For many devices in the field of optoelectronics and photonics, NLO crystals with high second harmonic generation conversion efficiencies and transparency in the visible and ultraviolet regions are needed. For its effective nonlinear optical characteristics, L-Histidinium family crystals have been the topic of substantial investigation by a number of researchers [3-4]. L-Histidinium Methyl Benzoate (LHMB), the molecule denoted by its name, has already been grown by gel and slow cooling method [5-7]. But there is no report is available for the growth of L-Histidinium Methyl Benzoate (LHMB) by solvent evaporation method using methyl benzoic acid. To the best of our knowledge this is the first report to the literature. In the present article we have reported the detailed thermal, optical, mechanical and spectral studies of LHMB.

### 2. Experimental

#### Synthesis and growth

The commercially available raw materials were purified by repeated recrystallization process and the recrystallized salt was used for the present synthesis process. L-histidine and methyl benzoic acid were mixed in the ratio of 3:1 in deionized water. The solution was stirred continuously for 24 hours and subsequently heated in order to complete the reaction process. Then the saturated solution was allowed to cool to room temperature and kept in a vibration free area with a tightly closed plastic cover [8]. Good quality single crystals of L-Histidinium Methyl Benzoate

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## AN EVALUATION POWER AND CARDIOVASCULAR ENDURANCE IN WEIGHT LIFTERS AND POWER LIFTERS

**Dr. A. Arunachalam, T Mamatha, Lakkuntla Rajitha, Jeyela Ganesh**

<sup>1</sup>Professor, <sup>2,3</sup>Assistant Professor, <sup>4</sup>UG Student, <sup>1,2,3,4</sup>Department of Physics, Kasireddy Narayanreddy college of engineering and Research, Hyderabad

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This research compared the strength and cardiovascular stamina of weight lifters (n = 100) versus power lifters (n = 100). The 2019–2020 academic years' H.P. state level competition is where the data for this study were gathered. Pull-ups, medicine ball throws, and basketball throw tests were used to gauge the strength of the arms and shoulders, the bent-knee sit-up test the strength of the abs, and the standing wide leap and vertical jump the strength of the legs. The Tuttle pulse ratio test was used to measure cardiovascular toughness. An independent "t" test was used to assess the significance of the difference in averages between weight lifters and power lifters. The results indicated that weight lifters have significantly stronger in arm and shoulder strength in comparison to power lifters, when measured by pull ups test, medicine ball put and basketball throw test. Weightlifters were also significantly stronger in abdominal strength and leg strength in comparison to power lifters. They have also shown significantly greater cardiovascular endurance in comparison to power lifters.

**Keywords:** Arm & Shoulder Strength, Abdominal strength, leg strength, cardio-vascular strength, weight lifters and power lifters

### **Introduction:**

Weightlifting has a lengthy history in the contemporary Olympic Games and has widespread and expanding global participation. Weightlifters must produce exceptionally high peak forces, contractile rates of force generation, high peak power outputs, and contractile impulses while doing the two competitive lifts, the snatch and the clean and jerk (C&J) (Garhammer, J. 1993 & Storey A et al, 2012). The goal of power lifting is to perform the squat, bench press, and dead lift exercises with the highest weights achievable for one repetition (one-repetition maximum, or 1-RM). Lifters compete in several classes depending on age, body mass, and gender. The earliest game that humans have ever played is probably weightlifting and powerlifting. In order to achieve high degree performance in these sports, it is essential to examine a weight lifters and power lifters from every possible aspect. Of course, it involves integral approach of different sport science specialties. However the role of strength and cardiovascular endurance is perhaps one of the most crucial in



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## AN EVALUATION POWER AND CARDIOVASCULAR ENDURANCE IN WEIGHT LIFTERS AND POWER LIFTERS

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### **Abstract**

This research compared the strength and cardiovascular stamina of weight lifters (n = 100) versus power lifters (n = 100). The 2019–2020 academic years' H.P. state level competition is where the data for this study were gathered. Pull-ups, medicine ball throws, and basketball throw tests were used to gauge the strength of the arms and shoulders, the bent-knee sit-up test the strength of the abs, and the standing wide leap and vertical jump the strength of the legs. The Tuttle pulse ratio test was used to measure cardiovascular toughness. An independent "t" test was used to assess the significance of the difference in averages between weight lifters and power lifters. The results indicated that weight lifters have significantly stronger in arm and shoulder strength in comparison to power lifters, when measured by pull ups test, medicine ball put and basketball throw test. Weightlifters were also significantly stronger in abdominal strength and leg strength in comparison to power lifters. They have also shown significantly greater cardiovascular endurance in comparison to power lifters.

**Keywords:** Arm & Shoulder Strength, Abdominal strength, leg strength, cardio-vascular strength, weight lifters and power lifters

### **Introduction:**

Weightlifting has a lengthy history in the contemporary Olympic Games and has widespread and expanding global participation. Weightlifters must produce exceptionally high peak forces, contractile rates of force generation, high peak power outputs, and contractile impulses while doing the two competitive lifts, the snatch and the clean and jerk (C&J) (Garhammer, J. 1993 & Storey A et al, 2012). The goal of power lifting is to perform the squat, bench press, and dead lift exercises with the highest weights achievable for one repetition (one-repetition maximum, or 1-RM). Lifters compete in several classes depending on age, body mass, and gender. The earliest game that humans have ever played is probably weightlifting and powerlifting. In order to achieve high degree performance in these sports, it is essential to examine a weight lifters and power lifters from every possible aspect. Of course, it involves integral approach of different sport science specialties. However the role of strength and cardiovascular endurance is perhaps one of the most crucial in

## Data security technique that obtains key for encryption and decryption using an adjacent matrix representation of the graph

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It is crucial to never provide sensitive information via an unprotected connection since unwanted parties may intercept it and compromise its privacy. Therefore, it has become necessary and inescapable to plan a cryptosystem that satisfies the security criteria in terms of the secrecy, integrity, and validity of transmitted data. In fact, a lot of study has been done in this area. Despite the fact that several cryptosystems have been proposed in the literature, it has been shown that their performance and durability differ considerably amongst them. Since the dawn of time, information protection has played a critical role in human existence. Graph theory is one of the approaches used to secure data protection and message transmission, which is one of the most crucial methods used in cryptography. Many techniques are available to encrypt and decrypt the info. Cryptography is especially used to make the text unintelligible and non-readable so that the opponents cannot understand the meaning of the text. it's used in many applications like e-commerce; electronic communications such as mobile communications, sending private emails; business transactions; Pay-TV; transmitting financial information; security of ATM cards; computer passwords etc, which touches on many aspects of our daily lives. Cryptography provides privacy and security for the key information by hiding it. it's done through mathematical technique. A cryptographic scheme is secure as long as it is unbreakable in reasonable amount of time, in spite of the opponent is conscious of the algorithm used and key size. during this paper, we are proposing an algorithm that uses adjacent matrix representation of the graph through which key's obtained for encryption and decryption.

**Key Words-** Cryptography, Substitution, Adjacent Matrix, Data Encryption

### Introduction

A readable communication may be made fully unreadable using a variety of techniques and ideas that are the foundation of the branch of cryptology known as cryptography. This field deals with several security challenges, including the privacy of persons, the secrecy of communication across insecure channels, the storage of data on insecure media, and others. To lessen the effect of hackers and to best prevent unwanted attempts to access this sensitive material, cryptography refers to the study and analysis of data encryption techniques. Information security's guiding principles, particularly those of confidentiality, integrity, authentication, and non-repudiation.

Confidentiality is a key part of security. This can be ensured by an encryption process where the data becomes unintelligible to any unauthorized parties trying to access it. The idea behind the encryption process is to turn plaintext into ciphertext so that only authorized parties can retrieve the message in its original format by reversing the encryption process, known as decryption. Technically, decryption should be extremely difficult for any unauthorized and unskilled parties attempting to perform it.

The main goal of Data Security is to secure data transmission over an unreliable network. When we send a message to someone, we always suspect that someone else will catch it and read or edit it before we send it again. There is always a desire to know about a secret message sent or received between two

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### ABSTRACT

This study examines a two-player, zero-sum game using a fuzzy payout matrix made up of pentagonal fuzzy integers. The fuzzy game problem is transformed into a crisp problem using a newly presented method, and then it is solved using the standard game problem method. Additionally, a comparison between the suggested strategy and the ranking system is done.

**Key words-** Pentagonal Fuzzy numbers, Fuzzy payoff matrix, Two person zeroSum game, Ranking

### 1. INTRODUCTION

The study of decision-making in circumstances where two or more rational adversaries try to maximize their benefit in competitive scenarios is known as game theory. According to this decision-making theory, each player chooses his course of action after taking into account the options that the opponent player has. This theory's goal is to understand how players choose their specific strategies to maximize their payoffs. John von Neumann, a mathematician, and economist Oskar Morgenstern invented the game theory method. The methodology used by Neumann (1947) [4] is based on the maximization of minimum losses, or the maximization of best out of worst. The fuzzy set theory was initially introduced by Zadeh in 1965 [6]. This concept of fuzzy decision that may be viewed as the intersection of given fuzzy goals and / or fuzzy constraints was illustrated by Bellman and Zadeh (1970) [1]. M. Cevikel

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In the current paper, we have proposed an approach for solving the fuzzy game problem by converting to its equivalent crisp form.

The rest of this paper is organized as follows. In section 2, we recall the basic definitions, in section 3, elaborates the mathematical formulation of fuzzy game problem we have proposed the solution for solving fuzzy game problem using pentagonal fuzzy numbers. In section 4, Numerical example is provided to illustrate the efficiency of the proposed method. Section 5 gives the conclusion of this Paper

### 2. Preliminaries

#### Fuzzy Numbers

A fuzzy range may be a generalization of an everyday complex quantity and that doesn't confer with one worth however rather to a connected a group of attainableworth, wherever every attainable

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An assessment study using daily return data based on volatility, randomness, nonlinearity, and chaos was conducted to determine the effects of the COVID-19 Pandemic on the Indian and American stock markets

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During the first wave of COVID-19 in 2020, financial markets all across the world, including India, faced a tremendous collapse. In 2021, COVID-19's second and third waves made landfall. The current study's goal is to determine the pandemic's effects from January 1, 2020, to December 31, 2021, on the leading stock markets in India and the United States, specifically the BSE SENSEX, NSE NIFTY, S&P 500, and Dow Jones. The measurement of nonlinearity, volatility, and chaos uses several methods. Although all of the indices are nonlinear, variable, and non-chaotic, the current investigation demonstrates that some structural changes are discernible within this time period.

**Keywords:** COVID-19, nonlinearity, GARCH, TGARCH, chaos

### 1. Introduction

The unpredicted shift in the global view brought on by the extraordinary COVID-19 pandemic's quick spread has endangered the whole planet. The SARS-CoV-2 virus, which started the COVID-19 pandemic, first appeared in Wuhan, Hubei province, China, in December 2019. Over time, it spread to other parts of the world. In addition to being a serious worldwide health disaster, this pandemic is also causing a huge global economic collapse. While adopting rigorous quarantine measures to combat the unforeseen outbreak, several nations abruptly stop all economic activity. International transportation restrictions and limitations have slowed down global economic activity. Most significantly, panic among consumers and businesses has stopped them from engaging in their typical purchasing habits, which has led to market irregularity. Uncertainty and risk were created due to this pandemic, causing significant economic impact all over the globe affecting both advanced and emerging economies such as the United States, Spain, Italy, Brazil, and India etc.

The government of India announced Janata Curfew on March 22, 2020, and the lockdown policy to maintain social distancing practices to slow down the outbreaks from March 24, 2020. As the government announced such a lockdown policy, various economic activities have been stopped suddenly. The financial market of India is witnessed sharp volatility because of the disruption of the global market [1]. BSE SENSEX witnessed a drop of 13.2%, on March 23, 2020, which was the highest single they decline after the event of the Harshad Mehta Scam, on April 28, 1991 [2]. Similarly, Nifty has also fell to almost 29% during this period. Some economists have considered the impact of COVID-19 on the Indian stock market as a "black swan event," that is, the occurrence of a highly unanticipated event with an extremely bad impact. USA Government imposed a lockdown one week before, on March 15, 2020. As an immediate consequence, Dow-Jones, S&P 500, and NASDAQ Composite indices slumped to 12.9%, 12% and 12.3%. respectively. This was the worst decline since 1987 "Black Monday" market crash. Due to the lockdown policy adopted by the government, the factories have reduced the size of their labor force as well as production level which disrupted the supply chain. Again, because of the uncertainty prevailing among mankind, people also reduce their consumption habits leading to demand-side shock. Studies have also found that the entire previous pandemic had affected only the demand chain. But this COVID-19 pandemic has affected both the demand chain and supply chain.

The second wave of COVID-19 hit and cast a cloud of uncertainty on the stock markets in India. Roughly in the month of January 2021, the second wave of COVID-19 struck India, reaching its peak on May 03, 2021, and by the end of May, the active cases started to decline. The third wave in India is again hit at the end of 2021 [3]. USA scenario is much worse. The second wave in USA

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Mucuna pruriens (L.), also known as velvet bean, cowitch, and kawaanchin in Hindi and cowhage in English, belongs to the Fabaceae family. M. Pruriens was especially notable in phytochemical and ayurvedic research because of his excellent therapeutic standards. Approximately 15 species of M.pruriens were identified, and it has been tested and proven to be hostile to tumour, antiparkinson, antidiabetic, sexual enhancer, against oxidant mitigation, and antibacterial as a possible restorative spice of India. This assessment is written in the form of a narrative and includes distributions of M. pruriens that are found outdoors, along with information about their life cycles, phytochemical components, common applications, therapeutic standards, and certain pharmacological tests.

**Keywords :** Mucuna pruriens, pharmacological, Photochemistry, antidiabetic

### Introduction

The role of medicinal plants in human existence is substantial. Between individuals and spices, there is a wonderful bond. Since almost 80% of the human population in developing countries depends on plant products for their basic medical needs, therapeutic plants already play a vital role in logical development and have certainly more hidden richness to discover.

In Africa and tropical Asia, mucuna pruriens is a native tropical vegetable that has been widely naturalised and cultivated. The Fabaceae family includes the Mucuna class. This second-largest category of flowering plants has 600 genera and over 12,000 species. The leaves, which might be bipinnate, palmate, or straight compound, are frequently described as alternatives. The petiole base is regularly ventured into a pulvinus which usually has capacities in the direction of the leaf. The blooms are typically androgynous actinomorphic to zygomorphic, far too perigynous and found regularly in racemes, spikes or heads. The perianth is usually one or more stamens, engaged frequently in different ways. Regularly stated the pistil is simple, consisting of a solitary style and shame and a prevalent ovary with at least two minimal ovules containing one locule. The organic product is normally loment, follicle, indehiscent unit, achene, drupe or berry, regularly a vegetable.

Once in a while the seeds have a hard coat with hourly glass lined cells and frequently bear a u- formed line called plaerogram. At root, they have inconsistent trifoliolate leaves. The blossoms are hued white to dim purple, and hang in long groups. Longitudinally, the units are sigmoid, swollen, and ribbed. The Samen are ovoid of dark or white. Mucuna units are covered with orange-ruddy hairs that are promptly ousted. Mucuna seeds gathered from different areas show distinctive herbal attributes, and atmosphere has no impact in Mucuna hereditary decent variety

### Vernacular names and synonyms of *Mucuna Pruriens*

S.No	Language	Common Name
1.	Chinese	Ci mao li dou
2.	Kannada.	Nasagunnikaayi
3.	Marathi	Khaajkuri

## Examining and identifying the arrangement and distributions on mucuna pruriens using photochemistry and pharmacological studies

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The scientific study of language is known as linguistics. According to various perspectives, linguistics can be divided into a number of branches as a science, including phonetics, phonology, morphology, syntax, and semantics (if it is based on a language as a system), historical/comparative linguistics, synchronic and diachronic linguistics, and sociolinguistics and psycholinguistics (if it is related to or combined with the discipline) (sociology and psychology respectively). Linguists look into how linguistic information is acquired, how it interacts with other mental processes, how it differs between speakers and geographical locations, and how to computationally represent this knowledge. They study how to represent the structure of various aspects of language (such as sounds or meaning), how to theoretically explain different linguistic patterns, and how different components of language interact with each other. Many linguists employ statistical analysis, mathematics, and logical formalism to account for the patterns they observe.

**Key Words:** branch, language, linguistics, morphology, science, structure, subject, syntax

#### Introduction

In order to qualify as a science, linguistics must meet certain criteria. It must have a topic matter first. Linguistics is claimed to include language as one of its topics. A language must be expressly and distinctly defined as a topic. Some linguists describe a language in a variety of ways before doing language analysis. Consider Finocchioro, who describes a language as a system of arbitrary vocal symbols that enables all members of a particular culture, or other individuals who have mastered that culture's system, to engage or communicate. As a result, the subject matter is explicitly and clearly stated to determine the scope of the analysis. This means that everything outside of the scope, such as gestures and physical movement, will be disregarded. So explicitness in defining the subject matter must be conducted in order that we know what must be studied/ analyzed and what must be left. Second, it must be based on an objective observation and/or investigation. This is to say that the observation and/or investigation on the subject matter must be conducted objectively. The result of observation and/or investigation must be described objectively too and it can be verified by any competent observer or investigator. So *objectivity* in conducting observation and/or investigation on the subject matter must be fulfilled in any scientific undertaking. Third, the result of observation and/or investigation must be systematically arranged. This must be conducted as an effort to show relationship within the subject matter. This is also meant to make the readers easy to read and study. Thus *systematicness* is also needed by linguistics. Language analysis for the sake to develop linguistics is done systematically within the framework of some general theory of language structure. The linguist tries to verify the theory by making objective observations of actual language data and modifies the theory in the light of what he perceives to be patterns or regularities underlying the data.

#### Branches of Linguistics

Some branches of linguistics are as follows:

1. Phonetics
2. Phonology
3. Morphology
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AN ANALYTICAL STUDY OF VIRTUAL TEACHING FOR UG STUDENTS IN THE GOVERNMENT SECTOR

<sup>1</sup>S Jan Reddy, <sup>2</sup>Dr. Vijay Anand, <sup>3</sup>Y Rathaiah, <sup>4</sup>Gunda Chandan

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**Abstract**

The article discusses the benefits of online classes for UG students in the public sector, as well as the resources they may use to enrol in the courses. It discusses the preliminary steps, abstractions, questions, and solutions. The pupils were given a questionnaire about online education. The questions drew responses from close to 250 pupils. Most kids admitted that they don't have access to a computer or the internet where they live. The majority of students expressed the opinion that they use the ZOOM online app to participate in online classes and that their professors assist them in studying online. When most houses lack electronic gadgets, the pupils enlist the aid of their siblings. However, most students favored online learning in covid time. Soon after completion of the pandemic, the students no longer concentrate or think about online classes.

**Keywords:** devices, losses, benefits, health issues, social and economical issue, rural, internet,

**Introduction**

India is adopting a National Educational Policy to ensure that young people receive high-quality education that meets international standards in terms of literature, culture, economics, and politics, among other things. As someone who was born in India, it is our major responsibility to inspire Indian kids to embrace modern technologies. Following this, several academic institutions began holding faculty training sessions. The pandemic days demonstrated the adage "Necessity is the mother of invention," showing us how to use technology and how the student community may access it. The international universities and a few Indian institutions are pushing online learning and providing enough opportunity for research and other activities. To promote technology, Virtual teaching was also introduced and infrastructure was developed in the UG institutions to connect with the other institutions and faculty. But it needs changes in curriculum, necessarily to work on accuracy and accountability.

However, to build the great and strong nation, it is a mandate to follow new technology which brings quick and rapid change in India. Private organizations like Jio and other mobile companies, trying to introduce new technology enabling access in the hand. Banning of certain foreign apps encouraged Indian young minds to create new apps. Certain online educational portals like MOOCS, Swayam, Swayam prabha are promoting online courses but need to develop on par with global standards. The flood of online teaching portals like Byju's, Unacademy, Vedantu, TutorMe, Chegg, Udemy, VIPKid, Magic Ears, Khan academy etc have come up in India and contributing their services. But the UG students studying in Government sector are not aware of these portals. If some of the students know about these, they can't bear the fee structure they fixed. Several problems have been identified and these issues have to be solved in order to sustain the quality of education for future generations. Basic requirements to attend the online education like Desktop, laptops, tablet or mobile phone, reliable internet, Web cam, Head phones, Soundless atmosphere are lacked.

A survey is taken up with the Under Graduate students studying in government institutions. 148 students were prospectively surveyed cited on different questions. The questionnaire was supplied to the different type of students studying urban and rural areas. For the question "Do you have reliable internet access in your home?", out of 148 students, 62 members responded that there is no internet facility in their homes, "not reliable" by 36 members, "somewhat reliable" was answered by 34 and extremely reliable by 16

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## ANALYSIS OF PERGULARIA DAEMIA'S PHYTOCHEMICAL AND PHARMACOLOGICAL CAPACITY (FORSK)

<sup>1</sup>Ch Sarika, <sup>2</sup>P Narayana Reddy, <sup>3</sup>Ch Mythri, <sup>4</sup>Mohammed Qasim Khan

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### Abstract

In India and other tropical and subtropical areas of the world, *Pergularia daemia* forsk (Asclepiadaceae) is a hispid perennial herb that is commonly found growing along the sides of roads. The whole plant has powerful therapeutic effects and is therefore traditionally used to cure a variety of illnesses, including infantile diarrhoea, jaundice, anthelmintic, laxative, antipyretic, and expectorant. The plant has been examined for alkaloids, flavonoids, saponins, and terpenes phytochemically. The plant has been shown to have a variety of pharmacological effects, including analgesic central nervous system depressant action, anti-inflammatory, hepatoprotective, anticancer, antidiabetic, antioxidant, antibacterial, antifungal, and anti-infertility effects. The taxonomic, phytochemical, pharmacological, and other significant elements of *Pergularia daemia* are covered in this review paper.

**Keywords:** phytochemistry, pharmacological activities, *pergularia daemia*, Ethnobotanical uses

### Introduction

There are several uses for plants and plant products. Since ancient times, nature has been a significant source of therapeutic agents. Many natural products have been discovered and developed from natural sources based on their use in traditional medicine. Today, many medicinal plants are of global interest due to their therapeutic and commercial importance. The World Health Organization estimates that between 85 and 90 percent of people worldwide use traditional herbal remedies, and the business for herbal drugs has experienced rapid expansion since the late 1990s as a result of the rising demand in both developing and industrialised nations [1]. Ayurveda, Unani, Siddha and Tibetan and other ancient systems of medicine have all benefited from the abundance of plant life in India [2]. The use of alternative medicinal therapy has increased the interest of pharmacologist over the past decades. Historically plants have provided a source of inspiration for Novel Drug components as plant-derived medicine have made large contribution to human health and well-being. In general, biological studies are very much essential to substantiate therapeutic properties of medicinal plants. The potential of medicinal plants as a source of new drugs is still largely unexplored. Research in medicinal plants has gained a renewed focus recently. The efficacy and safety of herbal medicine have turned the major pharmaceutical population towards medicinal plant research and so there are considerable evidences of increase in demand of medicinal plants [3]. Plant based system of medicine being natural does not have this serious problems. *Pergularia daemia* belongs to the family Asclepiadaceae. Generally the family Asclepiadaceae includes more than 2000 species under 280 genera are distributed worldwide in the tropical and subtropical regions [4]. The purpose of the present study is to gather together the available published information on the constituents of the plant and its pharmacological and chemical properties.

## ANALYSIS OF PERGULARIA DAEMIA'S PHYTOCHEMICAL AND PHARMACOLOGICAL CAPACITY (FORSK)

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### Abstract

In India and other tropical and subtropical areas of the world, *Pergularia daemia* forsk (Asclepiadaceae) is a hispid perennial herb that is commonly found growing along the sides of roads. The whole plant has powerful therapeutic effects and is therefore traditionally used to cure a variety of illnesses, including infantile diarrhoea, jaundice, anthelmintic, laxative, antipyretic, and expectorant. The plant has been examined for alkaloids, flavonoids, saponins, and terpenes phytochemically. The plant has been shown to have a variety of pharmacological effects, including analgesic central nervous system depressant action, anti-inflammatory, hepatoprotective, anticancer, antidiabetic, antioxidant, antibacterial, antifungal, and anti-infertility effects. The taxonomic, phytochemical, pharmacological, and other significant elements of *Pergularia daemia* are covered in this review paper.

**Keywords:** phytochemistry, pharmacological activities, *pergularia daemia*, Ethnobotanical uses

### Introduction

There are several uses for plants and plant products. Since ancient times, nature has been a significant source of therapeutic agents. Many natural products have been discovered and developed from natural sources based on their use in traditional medicine. Today, many medicinal plants are of global interest due to their therapeutic and commercial importance. The World Health Organization estimates that between 85 and 90 percent of people worldwide use traditional herbal remedies, and the business for herbal drugs has experienced rapid expansion since the late 1990s as a result of the rising demand in both developing and industrialised nations [1]. Ayurveda, Unani, Siddha and Tibetan and other ancient systems of medicine have all benefited from the abundance of plant life in India [2]. The use of alternative medicinal therapy has increased the interest of pharmacologist over the past decades. Historically plants have provided a source of inspiration for Novel Drug components as plant-derived medicine have made large contribution to human health and well-being. In general, biological studies are very much essential to substantiate therapeutic properties of medicinal plants. The potential of medicinal plants as a source of new drugs is still largely unexplored. Research in medicinal plants has gained a renewed focus recently. The efficacy and safety of herbal medicine have turned the major pharmaceutical population towards medicinal plant research and so there are considerable evidences of increase in demand of medicinal plants [3]. Plant based system of medicine being natural does not have this serious problems. *Pergularia daemia* belongs to the family Asclepiadaceae. Generally the family Asclepiadaceae includes more than 2000 species under 280 genera are distributed worldwide in the tropical and subtropical regions [4]. The purpose of the present study is to gather together the available published information on the constituents of the plant and its pharmacological and chemical properties.

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## Analyzing the hepatoprotective properties of *Pergularia daemia* aerial parts methanol extracts using carbon tetrachloride

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A perennial herb known as *Pergularia daemia* (Asclepiadaceae) is commonly seen growing beside roadsides in India and other tropical and subtropical parts of the world. It has been used to treat liver diseases in traditional medicine. The goal of the current investigation is to determine if the methanol extracts of the aerial portions of *Pergularia daemia* by carbon tetrachloride inducing in rats have hepatoprotective properties. In comparison to silymarin, which was used as a positive control, the methanolic extract at an oral dose of 2ml/kg demonstrated a significant ( $p < 0.05$ ) protective effect by decreasing serum transaminases (SGPT & SGOT), Alkaline phosphatase, total bilirubin, and raising levels of total protein and albumin. Histopathological analysis of liver slices was used to support these biochemical data. The flavonoid molecules may be the cause of the action. Furthermore the acute toxicity of the extracts showed no signs of toxicity up to a dose level of 2000mg/kg. Thus it could be concluded that methanolic extract of *Pergularia daemia* possesses significant hepatoprotective properties.

**Keywords:** Hepatoprotective, *Pergularia daemia*, CCl<sub>4</sub>.

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### MATERIALS AND METHODS

Animals used in the present study were procured from the small animals breeding station, Vijayawada, Andhra Pradesh, India. They were housed in polypropylene cages (38 x 23 x 10cm) with six animals per cage and maintained standard environmental conditions (14h dark/10h light cycles; temp 25±2°C; 35- 60% humidity, air ventilation) and were fed with standard pellet diet (M/s. Hindustan Lever Ltd., Mumbai, India) and fresh water *ad libitum*. The animals were acclimatized to the environment for two weeks prior to experiment use. Animals were fasted over night before the experimental schedule, but have free access for water *ad libitum*.



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## EFFICIENT CUSTOMER SATISFACTION ANALYSIS ON DIGITAL BANKING

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### ABSTRACT

This study establishes that digital banking refers to the use of the internet, mobile devices, and other electronic mediums as a delivery channel for banking services. These services include all conventional ones like checking your account balance, printing a statement, transferring money to another account, paying bills, and making payments without having to physically visit a bank. Given how prevalent digital banking is becoming, it is essential to conduct a survey and ascertain the degree of client satisfaction with online banking. We conducted the poll using primary data in order to determine the level of client satisfaction. In my questionnaire, I listed 10 questions. In today's highly competitive financial markets, developing long-term connections with consumers has become a critical strategy for the majority of financial institutions. By this survey we get to know the how efficient is the digital banking and how it is useful to its customers.

**Keywords:** Banks, customers, Digital banking, satisfaction, Transactions.

### INTRODUCTION

People can now purchase, sell, communicate, and engage in other activities all in one location thanks to advancements in modern culture. People today rely heavily on technology and the internet, which helped to create the digital age. The banking industry is undergoing a digital revolution that makes use of technology to make it easier for clients and other stakeholders to communicate and conduct business with banks through a range of channels, including the internet, wireless devices, ATMs, and physical branches. Digital banking relies on the internet, which is a reliable and economical channel for companies to communicate with their clients. The number of digital banking services to customers continues to grow and the internet offers huge opportunities for banks and other financial organizations. It can say that finally banks are finding that a comprehensive online banking strategy is essential for success in increasingly competitive financial service market. Competition in advancements in technology and lifestyles have changes the face of banking in the present environment are seeking alternative way to provide and differentiate their services. For success in growingly competitive financial market, banks are finding that an extensive online banking strategy is essential which also provides the security requirements.

### Objective of the study

To study the level of satisfaction of the customers using digital banking

### LITERATURE REVIEW

Ashima Tondon, Manisha Goel and Sunita Bishnoi (2016), Digital banking is regarded as a delivery channel, which over a period of time has gain recognition. It is in fact growing in many countries and

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### ABSTRACT

Indian migration is growing, and as a result, India's economy is experiencing a number of problems. The goal of this study is to comprehend the five-year trend of Indian migration to the United States. Its objectives include the different family kinds that emigrate, the effects of migration on Indian economic growth, and the connection between migration and Indian economic growth. Secondary data are used in this paper's research technique, and statistical tools are employed to represent the data. The Indian government can use the data analyzed in this study report to help with future migration regulations. The issues influencing the economy as a result of the migration of Indians are included in the conclusion.

**Key Words:** Migration, Economic development, Economy

### INTRODUCTION

Although migration is a common aspect of social and economic life in many nations, the characteristics of migrant populations differ depending on the source of migration. Indian immigrants began arriving in communities along the West Coast during the beginning of the 19th century, which marked the beginning of Indian immigration to the United States. Despite the fact that they initially arrived in modest numbers, by the middle of the 20th century, new opportunities had become available, and the population began to increase. In the United States as of 2019, there were roughly 2.7 million immigrants from India. Indian immigrants currently make up around 6% of the foreign-born population in the United States, making them the second-largest immigrant group in the nation after Mexican immigrants and ahead of those from China and the Philippines.

### OBJECTIVE OF THE STUDY

There are two objectives

1. Types of families leaving India

### REVIEW OF LITERATURE

#### 1.A NEW SURGE OF INTEREST IN MIGRATION & DEVELOPMENT

Although migration is an intrinsic part of human behaviour, from the very origin of our species, many people argue that, today, migration is different from the movements of the past. In at least one way, this is true. One of the distinctive characteristics of international migration today is that it does not necessarily represent so dramatic a break with the home country as it did before the second half of the 20th century.

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Although migration is an intrinsic part of human behaviour, from the very origin of our species, many people argue that, today, migration is different from the movements of the past. In at least one way, this is true. One of the distinctive characteristics of international migration today is that it does not necessarily represent so dramatic a break with the home country as it did before the second half of the 20th century.

#### 2.WHY SKILLED PEOPLE LEAVE HOME- AND WHY THEY SOMETIMES RETURN



A COMPLETE EXAMINATION OF HOW CELEBRITY ENDORSEMENTS  
AFFECT MOBILE SHOPPING

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### ABSTRACT

Despite indications that the adoption of mobile shopping has been slow due to the improved capabilities offered by smart phones, the expansion of marketing and retailing through the mobile channel has enormous potential. This article aims to advance our understanding of consumer shopping behavior through mobile devices by investigating attitudes toward the use of mobile devices for shopping, how consumers use their phones at various points during the decision-making process, the effects of involvement on the mobile consumer decision-making process, and mobile shopping locations..

**Key words:** engagement; customer decision-making; smart phones; mobile commerce.

### INTRODUCTION

Several industry sources report a sharp increase in the use of mobile devices throughout the purchasing process, and there is every reason to believe that this trend will continue as more and more individuals make purchases online.

The following section provides a brief overview of previous research on mobile marketing and shopping, with an emphasis on more recent studies conducted in the Smartphone era. The research methodology is then explained. This is based on a survey with a panel that was conducted. The outcomes are then made public. The section that follows offers a critical assessment of the finding. Finally, conclusions and recommendations summaries the major themes that are revealed by the research and the critical analysis and make suggestions for future work by practitioners and researchers.

#### Need of the study

The need of the study to gain knowledge about the celebrity endorsement and how it effect mobile shopping by considering consumer behaviour and analysing the research gap on impact on celebrity endorsement.

#### Scope of the study

The study attempts to asses an impact of mobile phone on different stages of purchase decision process and analyses if the demographic variable mediate the impact of mobile phone on consumer purchasing intentions on mobile.

### METHODOLOGY

#### RESEARCH DESIGN

It was deemed appropriate to conduct an exploratory study and to concentrate on behaviour profiling despite the fact that there have been a number of studies that aim to analyse the factors that affect the adoption of mobile shopping as well as other aspects of the mobile technology experience. This is due to the fact that most prior study was based on earlier generations of mobile

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## A STUDY ON CONSTRUCTION SITE SOIL CHARACTERISTICS ANALYSIS FOR PILE FOUNDATION

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### ABSTRACT

Pile foundations are constructed by digging piles into the ground up until a layer of stable soil is reached. Pile foundations have a higher bearing capacity and transmit structure load to the earth. Pile foundations are advantageous for large constructions or areas with unstable top soil that may deteriorate. For lateral loading resistance, pile foundations are frequently needed. Several factors can cause lateral loads, including as wind, earthquakes, waves, and ship strikes. Groups of piles are frequently constructed to boost the lateral capacity of the overall foundation system because a pile's lateral capacity is typically substantially lower than its axial capacity. The piles might be beaten in order to mobilize some of the higher axial capacity to resist the lateral load when vertical or plumb pile groupings do not provide enough lateral resistance. Making a detail study and experiment on soil investigation with geo technical service for piling works to be done for retaining wall in the location of VASCO DA GAMA near Vascodagama Railway Station in SANKVAL – VASCO DOUBLING PROJECT.

**Keywords:** Soil Characteristics, Pile Foundation, Higher Axial Capacity, lateral load.

### I. INTRODUCTION

For transporting and transmitting loads on soil that is thought to be weak in structure due to the soil characteristics, pile foundations have been employed for many years. Due to the availability of water and the need to guarantee the correct preservation of the region, communities and towns were first built near to lakes and rivers. As a result, timber piles that were physically pushed into the ground or fitted into holes that were filled with stones and sand were used to reinforce the poor bearing ground. After the industrial revolution, the traditional procedures for installing piles were changed, and methods for installing piles using machines powered by steam or diesel were introduced. Given the development of technologies of soil mechanics and other related disciplines, superior piles and pile installation system have been developed.

Foundations provide support to the structure, transfers the loads from the structure to the soil. But the layer at which the foundation transfers the load shall have an adequate bearing capacity and suitable settlement characteristics. There are several types of foundation depending on various considerations such as-

1. Total load from the superstructure.
2. Soil conditions.
3. Water level.
4. Noise and vibrations sensitivity.
5. Available resources.
6. Time-frame of the project.
7. Cost.

Broadly speaking, foundations can be classified as shallow foundations and deep foundations. Shallow footings are usually used when the bearing capacity of the surface soil is adequate to carry the loads imposed by a structure. On the other hand, deep foundations are usually used when the bearing capacity of the surface soil is not sufficient to carry the loads imposed by a structure. So, the loads have to be transferred to a deeper level where the soil layer has a higher bearing capacity.

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## UTILIZATION BAMBOO FIBER TO IMPROVE THE STRENGTH FOR BEHAVIOUR OF BLACK COTTON SOIL AS WELL AS THE ADDITION OF CALCIUM CARBONATE

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### ABSTRACT

Expansive soils are a concern that has been documented globally. As the water generated during the monsoon evaporates, they become smaller throughout the summer. Lightly laden civil engineering structures, such as residential buildings, pavements, and canal linings, suffer serious damage as a result of this alternate swelling and shrinking. A rising nation like India, which has a sizable population and geographic area, needs a sizable infrastructure, such as extensive networks of highways and structures. Almost all structures created by civil engineering are positioned on different soil layers. It may be characterized as a substance made up of rock fragments like sand, silt, and clay. By adding additives to the soil, it is possible to increase the physical characteristics of the soil, such as its strength, durability, and other qualities. Then different types of methods used for soil stabilization are: Soil stabilization using Lime, Soil stabilization using cement, Soil stabilization using Calcium & Sodium Carbonate, Soil Stabilization using Geo Synthetic Fibers and now new technology involving of soil stabilization of soil by using Bamboo Fibers with addition of calcium carbonate. For the experimental to study then it observed that 0.75% of Bamboo fiber test individually along with the combination of Calcium Carbonate with black cotton soil to improve their strength and durability of the soil. Finally, we observed laboratory testing reports to compare the treated and untreated black cotton soil to improve their soil properties to increase their strength, durability and improve their stiffness of the soil particles at any particular season regions.

**Keywords:** Black Cotton Soil, Bamboo Fiber, Calcium Carbonate, Soil Stabilization.

### I. INTRODUCTION

In a thorough assessment of soil structures, the characteristics of black cotton soil behavior included increased selling pressure, volumetric strain, shear strength, and durability. It refers to the use of proportioning and the use of appropriate admixtures to manage the compaction to increase soil stability and bearing power. Due to the lack of land with adequate natural bearing capacity, the availability of construction spaces is rapidly dwindling every day. It eventually causes structural fundamental problems in buildings built on shaky ground. Then, it's crucial to enhance the soil's qualities by adding bamboo fibers with a certain amount of calcium carbonate.

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## INVESTIGATIONAL STUDY ON STEEL FIBRE REINFORCED CONCRETE USING GGBS AND METAKAOLIN IN PARTICULAR PLACE OF CEMENT

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### ABSTRACT

In this cutting-edge circumstance, tangible assumptions have been considerably enlarged. Different actual bounds of anything, including power, sturdiness, usability, and expected support from life, need to be improved. This study examines the limits of cement's strength by partially replacing concrete with ground, granulated impact heater slag (GGBS). The tests were designed in accordance with Bureau of Indian Standards (BIS) to evaluate the viability of using GGBS as a partial replacement for concrete. To increase the substantial's durability, steel fiber was used. For a grade of M40, concrete's strength metrics including compressive strength and split tensile strength were tested and recorded. When compared to conventional cement, the partially replaced concrete demonstrated increased strength. a variety of mix combinations with a partial replacement of 0%, 10%, 20%, 30% by the weight of cement by GGBS and Metakaolin 0%, 5%, 10%, 15% was taken and 0.5%, 1% and 1.5% steel fiber of aspect ratio 50- 60 were used. The experimental outcomes show that the fractional substitution of concrete by both GGBS and steel fiber has an expansion in the strength of cement.. Considering all the strength parameters into account it was found that a 30% and 15% replacement of GGBS and Metakaolin with 1% steel fiber is optimum for M40 mix.

**Keywords** – METAKAOLIN and GGBS, STEEL FIBRE, fine aggregate, coarse aggregate, compressive strength, split tensile strength, flexural strength.

### Introduction

One of the most often utilized building materials is concrete. The manufacture of Portland cement is a significant source of carbon dioxide emissions. Because of human activity, the atmosphere is filled with greenhouse gases like carbon dioxide, which contribute to global warming. Carbon dioxide makes up roughly 65% of the greenhouse gases that cause global warming. There are several initiatives underway to decrease the amount of Portland cement used in concrete. In addition to identifying substitutes for Portland cement, these attempts involve the use of additional cementing ingredients such fly ash, silica fume, granulated blast furnace slag, rice-husk ash, and metakaolin. In terms of slowing down global warming, geopolymer technology might cut the carbon dioxide emissions from cement by 80%. [1]. In this paper, the effort was made to study the strength parameters of geopolymer concrete with GGBS and Metakaoline on Steel Fibre Reinforced Concrete [2-3].

There are two main constituents of geo polymers, namely the source materials and the alkaline liquids. The source materials for geopolymers based on alumina-silicate should be rich in silicon (Si) and aluminium (Al). These could be natural minerals such as kaolinite, clays, etc. Alternatively, by-product materials such as fly ash, GGBS, etc could be used as source materials. The choice of the source materials for making geopolymers depends on factors such as availability, cost, type of application, and specific demand of the end users. The alkaline liquids are from soluble alkali metals

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One of the most often utilized building materials is concrete. The manufacture of Portland cement is a significant source of carbon dioxide emissions. Because of human activity, the atmosphere is filled with greenhouse gases like carbon dioxide, which contribute to global warming. Carbon dioxide makes up roughly 65% of the greenhouse gases that cause global warming. There are several initiatives underway to decrease the amount of Portland cement used in concrete. In addition to identifying substitutes for Portland cement, these attempts involve the use of additional cementing ingredients such fly ash, silica fume, granulated blast furnace slag, rice-husk ash, and metakaolin. In terms of slowing down global warming, geopolymer technology might cut the carbon dioxide emissions from cement by 80%. [1]. In this paper, the effort was made to study the strength parameters of geopolymer concrete with GGBS and Metakaoline on Steel Fibre Reinforced Concrete [2-3].

There are two main constituents of geo polymers, namely the source materials and the alkalineliquids. The source materials for geopolymers based on alumina-silicate should be rich in silicon (Si) and aluminium (Al). These could be natural minerals such as kaolinite, clays, etc. Alternatively, by- product materials such as fly ash, GGBS, etc could be used as source materials. The choice of the source materials for making geopolymers depends on factors such as availability, cost, type of application, and specific demand of the end users. The alkaline liquids are from soluble alkali metals

## INVESTIGATIONAL STUDY ON STEEL FIBRE REINFORCED CONCRETE USING GGBS AND METAKAOLIN IN PARTICULAR PLACE OF CEMENT

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### ABSTRACT

In this cutting-edge circumstance, tangible assumptions have been considerably enlarged. Different actual bounds of anything, including power, sturdiness, usability, and expected support from life, need to be improved. This study examines the limits of cement's strength by partially replacing concrete with ground, granulated impact heater slag (GGBS). The tests were designed in accordance with Bureau of Indian Standards (BIS) to evaluate the viability of using GGBS as a partial replacement for concrete. To increase the substantial's durability, steel fiber was used. For a grade of M40, concrete's strength metrics including compressive strength and split tensile strength were tested and recorded. When compared to conventional cement, the partially replaced concrete demonstrated increased strength. a variety of mix combinations with a partial replacement of 0%, 10%, 20%, 30% by the weight of cement by GGBS and Metakaolin 0%, 5%, 10%,15% was taken and 0.5%, 1% and 1.5% steel fiber of aspect ratio 50- 60 were used. The experimental outcomes show that the fractional substitution of concrete by both GGBS and steel fiber has an expansion in the strength of cement.. Considering all the strength parameters into account it was foundthat a 30% and 15% replacement of GGBS and Metakaolin with 1% steel fiber is optimum for M40 mix.

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## ANALYSIS ON CONCRETE STRENGTH BEHAVIOR BY SUBTRACTING FINE AGGREGATE WITH GEO POLYMERS

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OPC and PPC are important building materials everywhere. A source of carbon dioxide emissions alongside deforestation and the use of fossil fuels is the cement making business. The atmosphere is polluted by greenhouse gases like CO<sub>2</sub>, which contribute to global warming. About 60–65% of global warming is caused by CO<sub>2</sub>. About 12% of the world's total greenhouse gas emissions come from the cement industry. Improved alternative concrete binders are required to alleviate Portland cement's negative environmental consequences. One of the efforts to produce more environmentally friendly concrete is the development of inorganic alumina-silicate polymer, called geopolymer, Geo polymers are obtained from materials of geological origin or by-product materials such as fly ash that are rich in silica and alumina .

In dissertation, low-calcium (Class F) fly ash-basedgeopolymer from different area Thermal power plants has beenused for the production of geopolymer concrete. The combination of sodium silicate solution and sodium hydroxide solution was used as alkaline solution for fly ash activation. Alkaline solution to fly ash ratio was varied as 0.35, 0.40 & 0.45.The concentration of sodium hydroxide solution was maintained as 8M (Molars).The curing condition ofgeopolymer concrete was varied as ambient curing and oven curing at 60°C varies up to 100°C. The compressive strength of the geopolymer concrete was tested at various ages such as 7, 14 and 28 days. According literature review we have to cure 28 days is enough ,if 56 days curing is also gives higherstrength ,in this review we meant for 28 days only.

### INTRODUCTION

The best foundations, architectural structures, bridges, roads, block walls, fences, and poles are made of concrete, a commonly utilized building material. A tone of CO<sub>2</sub> is released into the environment during the manufacturing of one tone of Portland cement. CO<sub>2</sub> makes up roughly 65% of the greenhouse gases that cause global warming. According to estimates, the manufacturing of ordinary Portland cement (OPC) accounts for about 1.35 billion tones of the world's annual greenhouse gas emissions, or about 7% of all greenhouse gas emissions to the earth's atmosphere. The cement industry, however, uses a lot of energy. Portland cement manufacturing, which uses 4GJ of energy per ton, is the most energy-intensive process after the production of aluminum and steel. After thermal power plants and the iron and steel sector, the Indian cement industry is the third largest user of coal in the country. The industry's capacity at the beginning of the year 2008-09 was about 198 million tones. The cement demand in India is expected to grow at 10% annually in the medium term buoyed by housing, infrastructure and corporate capital expenditures. Considering an expected production and consumption growth of 9 to 10 percent, the demand-supply position of the cement industry is expected to improve from 2008-09 onwards (Ragan & Hardjito, 2006 2005).

Coal-based thermal power installations in India contribute about 65% of the total installed capacity for electricity generation. In order to meet the growing energy demand of the country, coal- based thermal power generation is expected to play a dominant role in the future as well, since coal reserves in India are expected to last for more than 100 years. The ash content of coal used by thermal power plants in India varies between 25 and 45%. However, coal with an ash content of around 40% is predominantly used in India for thermal power generation. As a consequence, a huge amount of fly ash (FA) is generated in thermal power

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## CONCRETE COMPRESSIVE STRENGTH RESEARCH USING RESPONSIBLE INDUSTRIAL CERAMIC WASTE AS PARTIAL REPLACEMENT OF CEMENT

<sup>1</sup>P.MURALIDHAR, <sup>2</sup>M.PRANAY, <sup>3</sup>R.NARENDRA KUMAR, <sup>4</sup>B.JAHNAVI

<sup>4</sup>UG Student, <sup>1,2,3,4</sup>Department of Civil Engineering, Kasireddy Narayanreddy College Of Engineering And Research, Hyderabad

### ABSTRACT

The findings of tests testing the use of ceramic waste powder as a partial replacement for cement in concrete are presented in this publication. Environmental pollution comes from the sedimentation-based settlement and subsequent disposal of ceramic waste powder. The primary goal of this study is to substitute cement in concrete with waste ceramic powder. For M30, concrete samples with 10–40% powdered ceramic powder were created. Concrete mixtures were created, evaluated, and measured against traditional concrete in terms of strength. These tests were run to assess the mechanical qualities over the course of 7 and 28 days.

**Key Words:** Ceramic waste Powder, silica fume, cement concrete, compressive strength, split tensile strength and flexural strength.

### INTRODUCTION

India produces 100 million tones of ceramics annually. In the ceramics business, between 15% and 30% of the overall production is wasted. Currently, there is no recycling of this garbage in any way. The ceramic waste is tough, resilient, and highly resistant to forces of biological, chemical, and physical deterioration. Even though designated sites have been marked for dumping, the Ceramic Industries continue to dump the powder near their unit in any neighboring pit or empty spaces. When the powder dries, this causes considerable environmental and dust pollution and occupies a significant amount of land, thus it is imperative to swiftly dispose of any ceramic waste and use it in the building sector. As the ceramic waste is piling up every day, there is a pressure on ceramic industries to find a solution for its disposal. The advancement of concrete technology can reduce the consumption of natural resources. They have forced to focus on recovery, reuse of natural resources and find other alternatives. The use of the replacement materials offer cost reduction, energy savings, arguably superior products, and fewer hazards in the environment.

### WORKABILITY

The property of fresh concrete which is indicated by the amount of useful internal work required to fully compact the concrete without bleeding or segregation in the finished product. Workability is one of the physical parameters of concrete which affects the strength and durability as well as the cost of labor and appearance of the finished product. Concrete is said to be workable when it is easily placed and compacted homogeneously i.e without bleeding or Segregation. Unworkable concrete needs more work or effort to be compacted in place, also honeycombs &/or pockets may also be visible in finished concrete.

### DIFFERENT TEST METHODS FOR WORKABILITY MEASUREMENT

Depending upon the water cement ratio in the concrete mix, the workability may be determined by the following three methods.

Slump Test

Compaction Factor Test

Vee-bee Consist meter Test

In this study, the slump-cone test and compaction factor tests were carried out to determine the workability of concrete. The test procedures are given below:



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## DESIGN AND DEVELOPMENT OF AUTOMATIC SOLAR PANEL CLEANING SYSTEM BASED ON ARDUINO

<sup>1</sup>K.Bheema, <sup>2</sup>A.Munil Reddy, <sup>3</sup>M.Anitha, <sup>4</sup>B.Kotesh

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### ABSTRACT

The goal of this study is to put out a novel idea for addressing the rapidly rising global energy demand for a number of purposes. There are countless renewable energy sources, such as the sun and wind. In nature, solar energy is abundant and is proving useful in a wide range of applications, including water heating, home appliances, street lighting, agriculture, and industry. One way to use solar energy is through solar panels. The effectiveness of solar energy in every application is constrained by factors including dust, humidity, and temperature. A solar panel's electrical properties are vulnerable to dust collection, which will change the panel's transmittance and reduce its efficiency. One way to improve the effectiveness of a solar panel is to remove the dust that has gathered on it. Solar panel cleaning is a challenging task. Washing the solar panels by hand is the traditional method of cleaning; however, it is inefficient and ineffective. The efficiency of a solar panel is assessed by measuring the voltage and current of a specific panel with and without dust over several days, weeks, and months. Therefore, the efficiency of solar panels is compared using the recorded values. The proposed automatic cleaning mechanism provides effective, non-abrasive cleaning and prevents power generation anomalies caused by dust accumulation on the solar panel. According to the study, regular cleaning raises the average efficiency of solar panels by roughly 1.6 percent to 2.2 percent. The efficiency of the developed model is maximized.

### 1. INTRODUCTION

It is essential to increase solar power generation efficiency. In our area, solar panels lose a lot of power when unfavorable impediments cover the panel surface. Consequently, we tested a self-cleaning solar panel. The obstruction is removed by this cleaning method on its own. For a predetermined period of time, Arduino chooses to clean the solar panel. Our system is trustworthy and easy to use.

### 2. METHODOLOGY AND DESIGN

The recommended solar panel cleaning system is employed. Four different types of sands are used as dust. After that, swiping is done with a soft cloth wiper. As a result, there is no need to use water to clean the system this feature guard against damage to the solar panel. The major components are a solar panel, a microcontroller (Arduino Uno), a metallic dc gear motor, a voltage source, and a motor drive module. The specifications and reasons for some of the key components used in the suggested cleaning technique are shown in the table:

TABLE I. PROPERTIES OF MAJOR COMPONENTS

Name	Purpose and Rating
Solar panel	10W, 21V solar panel is used in this system.
DC gear motor	metallic dc gear motor is connected to the cleaning shaft to operate it. The operating voltage, current, and speed are 12V dc, 330mA, and 100 rpm.
LDR sensor	light-dependent resistor (LDR) is used here to rack the sunlight.

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### 1. INTRODUCTION

It is essential to increase solar power generation efficiency. In our area, solar panels lose a lot of power when unfavorable impediments cover the panel surface. Consequently, we tested a self-cleaning solar panel. The obstruction is removed by this cleaning method on its own. For a predetermined period of time, Arduino chooses to clean the solar panel. Our system is trustworthy and easy to use.

### 2. METHODOLOGY AND DESIGN

The recommended solar panel cleaning system is employed. Four different types of sands are used as dust. After that, swiping is done with a soft cloth wiper. As a result, there is no need to use water to clean the system this feature guard against damage to the solar panel. The major components are a solar panel, a microcontroller (Arduino Uno), a metallic dc gear motor, a voltage source, and a motor drive module. The specifications and reasons for some of the key components used in the suggested cleaning technique are shown in the table:

TABLE I. PROPERTIES OF MAJOR COMPONENTS

Name	Purpose and Rating
Solar panel	10W, 21V solar panel is used in this system.
DC gear motor	metallic dc gear motor is connected to the cleaning shaft to operate it. The operating voltage, current, and speed are 12V dc, 330mA, and 100 rpm.
LDR sensor	light-dependent resistor (LDR) is used here to rack the sunlight.

## GSM, GPS, AND SPEED INDICATOR FOR REAL-TIME VEHICLE THEFT DETECTION AND TRACKING

<sup>1</sup>V.Ravi Kumar, <sup>2</sup>Dr.K.Srinivasan, <sup>3</sup>K.Swapna, <sup>4</sup>Ch.Kumidini

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### ABSTRACT

Nowadays, with almost everyone owning a car, theft in parking lots and occasionally driving insecure locations is prevalent. Vehicle safety is crucial for automobiles used for personal transportation. A vehicle tracking and locking device has been installed on the car to keep track of its whereabouts and lock the engine. The Global Positioning System was used to locate the automobile (GPS). Utilizing the Global System for Mobile Communications (GSM) These technologies deliver status updates as needed while continuously monitoring a moving vehicle. When the theft is discovered, the perpetrator sends a message through SMS to the microcontroller, which then instructs the engine to turn off. To restart the vehicle and access the door, an authorized individual must send the password to the controller. This project also shows the vehicle's speed, which can be useful. The project also shows the vehicle's speed, which can be computed using distance and time. This is more secure, dependable, and cost-effective.

**KEYWORDS:** GSM and GPS, Vehicle Tracking, Fuel and Speed Indicators.

### 1. INTRODUCTION

In recent decades, India has evolved at such a quick rate that several firms have made significant investments there. These companies employ a sizable staff. The logistics of providing transportation for such a large gathering are complex and difficult. In general, municipal transportation contractors establish contracts for this mode of transportation on an annual basis in the wake of recent tragedies like burglaries and rape cases, for instance. The development of satellite communication technology has simplified the process of finding moving objects.

Vehicle tracking systems have made this technology accessible to the average individual. Today, GPS is widely used. On the roads of developed countries, ambulances, fleets, and police vehicles are common sights. All of them the vehicle's whereabouts can be tracked using existing technology. One of the most important systems that integrate both GSM and GPS technology is the GPS/GSM Based System. It is required due to the numerous uses of GSM and GPS systems, as well as their widespread use by millions of individuals throughout the world. This system is intended for users in the land building and transportation industries. Company providing real-time information such as the user's location, speed, and projected arrival time. Automobiles in a clear, easy-to-understand format. This technique could also be beneficial for inter-office communication there are two points.

At the moment, GPS car tracking ensures their safety while on the road. This car tracking technology was discovered in clients' vehicles. Vehicles as a deterrent to theft and a means of rescue the signal generated by the vehicle owner or the police is followed by the vehicle owner or the police. The GPS/GSM Based System is one of the most prominent systems that combine GSM and GPS technology. Due of the diverse applications of GSM and GPS systems, as well as their ubiquitous use by millions of people throughout the world, it is essential. Users in the land development and transportation industries will benefit from this system. Company

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## HIGH BEAM ADAPTATION AND TEMPERATURE CONTROLLER FOR SMART ELECTRIC VEHICLE CHARGING

<sup>1</sup>P.Kiran, <sup>2</sup>G.Manoj Kumar, <sup>3</sup>J.Sai Kiran, <sup>4</sup>T.Naga Laxmi

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### ABSTRACT

All technology in the modern world is powered by electricity. Many individuals are opting to go green in this age of environmental awareness and global warming, which has been made feasible by the development of electrical automobiles. In recent years, using electric vehicles has become more and more prevalent. In addition to generating less pollution, electric cars also require less upkeep. Before deciding to make an electric vehicle their next major purchase, each person needs to take into account some drawbacks even though the proof of the benefits has become extremely evident. The reasons are burst out of battery in Electrical vehicle which is mainly due to long duration of charge and rise of temperature and one of the foremost reason for accidents to take place during night time is of not using beam of light. So to overcome the above mentioned cons we have come up with an idea of automatic turn off charging for electric vehicle and also providing with temperature alert system in order to prevent the blasting of electric vehicle, now coming to prevent the accidents caused due to beam of light we are implementing automatic beam modification by using Arduino UNO we have a developed a code to disconnect the charge and temperature sensor senses the rise in temperature and when the temperature exceeds certain limit it will notify us and for this we use temperature controller, while coming to beam adjustment we use an LDR module. So by using other required components we will achieve our objective.

Keywords: LDR module, Arduino UNO, global warning, electrical automobiles, Automatic High Beam Adjustment, IR sensors.

### 1. INTRODUCTION

Our daily lives now include automobiles, on which we have grown utterly dependent. Due to this, almost all automakers are forced to consider additional features and redundant safety equipment to protect drug users. Modern automobiles come equipped with a range of lights to provide lighting in a number of situations. Typically, headlamps are programmed to alternately produce low shafts and high shafts. Low shafts are used at night to light the way forward when there are other cars because they provide less lighting.

High shafts give significantly further light and are use to illuminate the vehicle's forward path when other vehicles aren't present. Daylight running lights have also begun to witness wide acceptance. High ray are used for illuminating a road does not have veritably important business on it. By that way the motorist can see further ahead for any road obstructions. High ray is also used when a motorist is one an strange road and if there is not important in the way of lighting similar as road lights. Automatic high ray, as explained is contrary ray sensor. Another operation of automatic high ray is our high ray response due to another high ray and automatically our high ray getting low. Now a day there are numerous accidents that beget from the ray light. Our work proposes an effective automatic control of the vehicle headlamps grounded on the discovery of head lights and tail lights under night time road conditions. This design is about to control high/ low ray automatically. This design will make sure that the consumer will save their time and energy also for those who have the illness of nervous. This design won't disturb any homemade function of the ray.

The latest technology to address the comfort use of EVs and to reduce the percentage of accidents is to use coolant systems. Now-a-days accidents are caused due to increase in the temperature of the battery which

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<sup>1</sup>N. Srikanth, <sup>2</sup>Ch Dhanraj, <sup>3</sup>Ch Tejaswi, <sup>4</sup>P Sekhar  
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### ABSTRACT

When assessing a shell and tube heat exchanger, it's crucial to take thermal performance and pressure drop into account. The type of baffles employed in various orientations and the direction of fluid flow have an impact on both thermal performance and pressure drop. Baffle complexity increases enhance heat transmission but also increasing pressure loss, requiring more pumping power. The effectiveness of the system is impacted by this. This thesis presents the numerical simulations on several baffles, including single segmental, double segmental and helical baffles. This image illustrates how baffles affect pressure drop in a shell and tube heat exchanger. Individual segmental baffles show how dead zones form when heat transfer is inhibited. Double segmented baffles are superior to single segmented baffles reduce vibration damage. Because dead zones are eliminated when helical baffles are used, pressure drop is reduced. Heat transfer is improved when there are fewer dead zones. Smaller pumping power is required as a result of the lower pressure drop, which improves overall system efficiency. The results reveal that helical baffles are superior to the other two types of baffles.

**Keywords:** Shell and tube heat exchanger, baffle, segmental baffle, double segmental baffle, helical baffle, overall performance etc.

### I. INTRODUCTION

In order to meet the demands of power plants, such as condensers and feed water heaters working under relatively high pressures, the fundamental design of shell and tube exchangers was established in the early 1900s. Technology for making shell and tubes improved considerably throughout the 1920s, mostly as a result of the efforts of a select few significant producers [1]. Units up to 500 m<sup>2</sup>, or around 750 mm diameter and 6 m length, were produced for the oil industry's explosive growth. The data coming out of ideal tube banks helped designers define design ideas in the 1930s. The literature does not even begin to describe shell side pressure drop until the late 1940s. One of the most challenging issues for shell side flow was viscous flow, which was poorly understood until the 1960's.

Shell and tube exchangers are the most generally utilized sort of heat exchangers due to their extensive variety of configuration and working conditions and rugged conditions. They are used in the power stations, chemical industries, process industries etc. Shell and tube exchangers provide relatively large ratios of heat transfer area to volume and weight and they can be easily cleaned. Pressure can vary from vacuum to very high values and permissible pressure drop can vary within a wide range. The design can be adjusted independently for each fluid because of a variety of shell flow types and tube bundle arrangements. Thermal stresses can be accommodated rather inexpensively. The sizes of heat exchanger vary from very small to extremely large values (5000 m<sup>2</sup>). Positive separation of fluids can be obtained. Heat exchangers are ubiquitous pieces of equipment in the process industry. There are different types and designs of heat exchangers are available both commercially and domestically.

Heat exchangers can be of many types. The classification of heat exchangers in terms of construction can be of four different types. These heat exchangers can be tubular, plate type, extended surface, regenerative type. Examples of tubular heat exchanger are shell and tube heat exchangers, double pipe heat exchangers and spiral tubes etc. Plate heat exchangers consist of various plates stacked together giving maximum surface area for heat transfer. Extended surfaces are the surfaces which are attached to the body so as to give maximum surface for heat transfer [2-6].

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## EXAMINATION ON DEPICTION AND FABRICATION OF AL 7075MMC ALUMINUM ALLOY USING REINFORCED GRAPHITE

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### ABSTRACT

Due to their high specific strength, high process ability, anti-corrosion properties, and environmentally friendly design, aluminum alloys are often utilized in the fields of automotive, aerospace, packaging, and electronic technology. Al 7075, an aluminum alloy, has been utilized as a matrix material and graphite has been used to boost the surface hardness of the alloy since it is a widely used alloy in aerospace appliances due to its high strength and resilience to stress and strain. Mechanical tests including compression, hardness, and weld ability have been conducted to better understand the increased characteristics of the alloys. Microstructure characterization is used to verify the graphite's homogeneous distribution in the matrix material.

**Key words:** Aluminum Alloy, AL 7075MMC, graphite, steel

### 1. Introduction

When two or more constituent elements are fused together, a composite material is created that has distinct qualities that are different from those of the separate materials, frequently producing a better product.

A composite material is any mixture of two or more chemically different metals or ceramics that has been reinforced with fibers or particles to enhance its characteristics. Despite working together, the elements do not totally dissolve or otherwise become one with the composite; they still maintain their own identities. Because of their flexibility to many settings and relative simplicity of combining with other materials to fulfill specific purposes and display desirable features, composites are one of the most commonly utilized materials. Aluminium 7075 alloy constitutes are widely employed in aircraft and aerospace industry. The most important benefit of Aluminium 7075 is its high strength. Its resistance to stress and strain makes it highly useful in aerospace applications where it allows for weight savings over steel.

### Advantages of composite materials

The longitudinal strength of composite is 4 to times higher than conventional metal.

The composite material has more stiffness and improves mechanical strength.

The composites are used for vibration absorbing material because it has less noisy materials and provide low vibration transmission than metals.

It is used for dynamic characteristics like fatigue, and also used for impact, environmental resistance and low maintenance cost.

The cost of composite material is low when compared to metals.

It reveals good corrosion resistance property.

### 3. Literature Survey

Jianwen zhao et al. [3], carried out experiment "A synthesis Fatigue of 7075- 7651 aluminium alloy" The Fatigue experiment were conducted using aluminium alloy under uniaxial, torsion and axial-torsion, the fatigue process consists pf crack initiation and crack propagation to failure. The Fatigue experiment were conducted

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## EXOSKELETON ARM DESIGN AND PRODUCTION USING A BLUETOOTH MODULE

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### ABSTRACT

In contrast to a human's internal skeleton (endoskeleton), an exoskeleton is the exterior skeletal structure that supports or shields the body. Many people across the world are bound to wheelchairs as a result of illnesses or injuries that weaken muscles. Muscular dystrophy is one such disorder; those who have it have restricted muscle action, which can lead to muscle waist, muscle hypertrophy, and muscle discomfort. The exoskeleton is becoming more crucial to humans in a variety of areas, including power assistance, muscle development, motor function, and rehabilitation. Creating a voice-activated exoskeleton arm is the goal of this project. The user initially trains the voice recognition module with the proper words that should be recognized. The output of the speech recognition kit is sent to the Arduino microcontroller. According to the inputs received by the Arduino, appropriate signals are now sent to the motor driver to rotate the required motor in the specific direction. Pulse width modulation is used to set the required speed with which the motor has to rotate. Thus, each part of the robotic arm can be controlled by controlling the direction of that particular motor. The motor continues to rotate until the user says a second command or a stop command. When the stop command is said all the motors remain ideal. The advantage of using this exoskeleton arm is disabled people can regain the use of their limbs using the exoskeleton arm. Parkinsons people can gain the rehabilitation. Hence an attempt has been made to build a blue tooth operated exoskeleton arm for disabled people.

**Keywords:** online shopping, convenience, web site quality, awareness

### INTRODUCTION

In contrast to a human's internal skeleton (endoskeleton), an exoskeleton is the exterior skeletal structure that supports or shields the body. It has joints and structural elements that resemble the human body very significantly. Many people across the world are bound to wheelchairs as a result of illnesses or injuries that weaken muscles. Muscular dystrophy is one such disorder; those who have it have restricted muscle action, which can lead to muscle waist, muscle hypertrophy, and muscle discomfort.

### STATEMENT OF THE PROBLEM

The recent examinations by the World Health Organization (WHO) says that about 15% of the total population experiences a type of inability, in that more than half cannot bear the cost of health care systems. Due to different reasons, the general and appendage brokenness patients are expanding. There are more than 10 million disabled all over, out of which 30% are arm disabled persons. Many of the people as been diagnosed with different types of injuries and new cases have been diagnosing still. Almost 50% of these cases bring about some loss of sensation or movement to the arms and hands. The growth and use of exoskeleton arm is considered as the major remedy for this situation where the muscles do not receive any signals from the central nervous system.

Keeping above points in mind an attempt has been made to design and fabricate blue tooth operated exoskeleton for disabled people, further utilized paralyzed people can make movement of their arm using the device and In industries to lift any weights and also In military to lift heavier objects and relieve strain on the body during physical operations.

### Objectives of the study

- To develop a prototype project of voice operated exoskeleton arm by using Bluetooth module.
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## INFLUENCE OF AL7075-BERYL-GRAPHENE HYBRID MMCS HARDNESS AND DURABILITY ATTITUDES ALTERED BY MULTI DIRECTIONAL FORGING

<sup>1</sup>R.Surendra Rao, <sup>2</sup>M.surendar, <sup>3</sup>K.Suresh, <sup>4</sup>S Deepak

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### ABSTRACT

The current work examines the microstructure, hardness, and wears behaviour of hybrid nano metal matrix composites that contain Al7075 as the matrix material and Beryl and Graphene Nano Platelets (GNPs) as reinforcing components. The weight percentage (wt%) of beryl is 6wt%, whereas the weight percentages of GNPs range from 1wt% to 2wt%. The liquid metallurgical procedure stir casting, which is the most practical and popular, was employed to make the hybrid nano composites. The purpose of this study was to combine heat treatment with multidirectional forging (MDF), a method of extreme plastic deformation. In this study, the impacts of several heat treatments, such as annealing, solid solution, peak ageing, and over ageing before MDF, on mechanical characteristics were examined. The heat-treated material is processed with the multi-directional forging (MDF) technique procedure at 200°C. A scanning electron microscope (SEM) is used to study the effect of adding Graphene and Beryl reinforcement material in Al 7075 alloy, and a Vickers hardness test is performed to examine the hardness of developed as-cast and MDF processed composites. The Pin-On Disc test is used to study the wear behavior of the as-cast and MDF processed Composites. The SEM results reveals the uniform distribution of the reinforcement in Al7075 alloy. Increased hardness is noticed post incorporation of Graphene and Beryl reinforcement as compared to Al7075 alloy.

**Keywords:** Al7075 Alloy, Beryl, Graphene, Severe plastic deformation, Microstructure

### INTRODUCTION

Aluminum alloys are also visually appealing metallic materials for a number of applications due to the unique characteristic combinations they provide. The present generation's rising technologies and trends mandate the integration of numerous features and the shrinking of cumbersome structures to light weight structures in order to fulfill application needs [1,5]. Aluminum alloys are employed in structural applications more frequently than steel, which is the primary metal. The Al7075 alloy is used in a number of stressed structural applications, including those for airplanes. Aluminum-based Metal Matrix Composites (MMCs) are employed in many automotive applications because they have a variety of improved customizable properties. Numerous researchers have been inspired to investigate novel materials and cutting-edge methods of their preparation by the need to enhance the mechanical properties of aluminum alloys. In order to meet the needs of various engineering applications, research primarily focuses on identifying reinforcing materials with superior mechanical properties. The type of reinforcements employed affects the aluminum matrix's performance. Several reinforcements, including SiC, C, B4C, Al2O3, Al3Ni, ZrO2, W, and TiC, have been utilized by researchers to improve the functionality and characteristics of AMMCs. It has been discovered that beryl and graphene nanoplatelets (GNPs) are the best reinforcing materials for enhancing the characteristics of aluminium MMCs. Al alloy can be strengthened primarily through alloying and age-hardening [5-6]. New complementary and alternative approaches, based on straining and grain refinement, are nonetheless presented. As a result, over the past 20 years, several efforts have been made to develop ultrafine grained (UFG) materials. The Hybrid Metal Matrix is a significant advancement in the development of advanced materials. Aluminium and its alloys are the most

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## AN INNOVATIVE COMPARATOR DESIGN USING QUANTUM-DOT CELLULAR AUTOMATA TO DECREASE ENERGY DISSIPATION

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### ABSTRACT

The limitation raised in CMOS technology lead us to implement a technology with high computational speed and low power consumption. The technology is quantum dot cellular automata which is the most propitious technology. The CMOS technology is cladding the complications in nanotechnology world, but quantum dot cellular automata can conquer even these issues. In this paper, 1-bit comparator and 2-bit comparator designs are implemented using Majority Gates (MGs). The complementary parameters in quantum dot cellular automata are delay, area, energy dissipation and cell count. The dominant parameter is power consumption. Hence we proposed designs of 2-bit comparator circuits with quantum dot cellular automata cells which minimizes the energy dissipation, provides effective area and also reduces cell count which will provide enhancement over the existing comparator circuits. So, the proposed designs achieved reduction in the cell count, area and energy dissipation have reached approximately 68%, 70% and 71% respectively compared with previous designs.

**KEYWORDS:** QCA, Majority Gates, Comparator, Nano Computing, Quantum Cells, Quantum Dots.

### 1. INTRODUCTION

There are numerous affairs related to power consumption, area, delay, in digital electronics and in CMOS technology. This has become a biggest provocation for transistor circuits. Overcoming these limitations these limitations, the arise of alternate technology called Quantum- dot cellular automata (QCA) came into existence [1]. QCA is a favourable technology in the field of nano electronics that could be utilized in many image processing applications. QCA architecture will provide better performance by exploiting parallel processing, better silicon area utilization, maximation of clock speed and very low power consumption which is modified and enhanced application of the electron tunneling [2]. In this paper, area-efficient comparator structures having low energy dissipation are designed and implemented based on QCA.

#### 1.1 QCA TECHNOLOGY

1.2 QCA consists of 4 quantum dots. In QCA cell the separation between quantum dots are 20nm and separation between quantum cells are around 80nm. The electrons are placed at the maximum possible distance from each other due to coulomb repulsive force. These stable states are called as "polarization". QCA cell can be defined in the following figure.

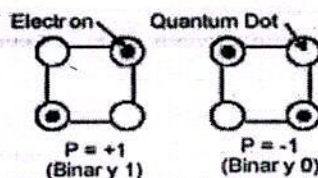


Fig.1 Polarization

From the Fig 1, it consists of 2 states namely binary 1 and binary 2 which are indicated by polarity +1 and -1 respectively.

#### 1.2 MAJORITY GATE



## AN INNOVATIVE COMPARATOR DESIGN USING QUANTUM-DOT CELLULAR AUTOMATA TO DECREASE ENERGY DISSIPATION

<sup>1</sup>L.Prathima, <sup>2</sup>M.Harshitha Goud, <sup>3</sup>M.Varasundar, <sup>4</sup>Rajeshwar Reddy

<sup>1,2,3</sup> Assistant Professor, <sup>4</sup>UG Student, <sup>1,2,3,4</sup> Department of Electronics and Communication Engineering, Kasireddy Narayanreddy college of engineering and Research, Hyderabad

### ABSTRACT

The limitation raised in CMOS technology lead us to implement a technology with high computational speed and low power consumption. The technology is quantum dot cellular automata which is the most propitious technology. The CMOS technology is cladding the complications in nanotechnology world, but quantum dot cellular automata can conquer even these issues. In this paper, 1-bit comparator and 2-bit comparator designs are implemented using Majority Gates (MGs). The complementary parameters in quantum dot cellular automata are delay, area, energy dissipation and cell count. The dominant parameter is power consumption. Hence we proposed designs of 2-bit comparator circuits with quantum dot cellular automata cells which minimizes the energy dissipation, provides effective area and also reduces cell count which will provide enhancement over the existing comparator circuits. So, the proposed designs achieved reduction in the cell count, area and energy dissipation have reached approximately 68%, 70% and 71% respectively compared with previous designs.

**KEYWORDS:** QCA, Majority Gates, Comparator, Nano Computing, Quantum Cells, Quantum Dots.

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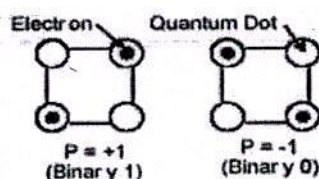


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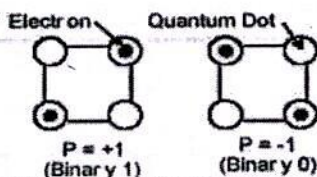


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## A PROCESS FOR EFFECTIVE FEATURE SEGMENTATION BASED MULTILEVEL THRESHOLDING UTILIZING MODIFIED CUCKOO SEARCH TECHNIQUE

<sup>1</sup>M.Nikhil Sitharam, <sup>2</sup>K.Srikanth, <sup>3</sup>K.Kiran, <sup>4</sup>L.Pooja

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### ABSTRACT

Image segmentation is the process of dividing an image into many regions in order to find individual object in an image. Image segmentation is one of the principle steps to be followed in image processing. The traditional bi-thresholding technique used in image segmentation is not efficient in case of multiple regions of interest in image. In order to overcome this problem multilevel thresholding based image segmentation is proposed. Unlike bi-level thresholding, multi-level thresholding technique can encounter more than one gray-level threshold values making it easier to make out the object of interest within the image, but it exhibits increased time complexity. Thus, an evolutionary algorithm based segmentation approach is proposed to overcome this problem. Adaptive image processing is used to enhance or restore data by removing noise without significantly blurring the structures in the image with respect to change in environmental factors. There are several bio-inspired evolutionary algorithms like firefly, Sparrow search, Artificial Bee Colony (ABC) and many more. Although these algorithms are efficient they have few optimization problems. Cuckoo search algorithm is a nature inspired optimization Meta-heuristic algorithm that can be applied in solving optimization problems and computational intelligence. An important advantage of this algorithm is its simplicity. One of the major limitations of CS algorithm is slower convergence rate. In this project, a Modified CS algorithm is proposed to improve the convergence rate even at high number of dimensions. In MCS, a dynamic weighted random walk is also adopted in order to enhance local search efficiency.

**Keywords:** Image Segmentation, Multi-level thresholding, Modified Cuckoo Search Algorithm, Objective functions.

### 1. Introduction

Image segmentation is the introductory pre-processing step to examine the image and it finds operations in videotape processing, medical analysis, computer vision, artificial production and so forth [1]. The aim of the image segmentation is reducing and simplifying the presentation of the image for easier analysis. The segmentation process separates the pixels of the image into different groups according to their similitude [2]. Thresholding technique is one of the most simple and effective segmentation system among all existing methods. Its accuracy, simplicity and robustness make it so popular when compared with other available techniques [2]. Threshold segmentation algorithm is a simple and efficient system in image segmentation, which has the advantages of small computation, simple perpetration, and stable performance. It is to divide the image pixel points into several classes grounded on several suitable thresholds setup in the whole image, and to ensure that each set of pixel points divided is consistent from the perspective of gray level. Generally speaking, image segmentation is substantially divided into single-threshold and multi-threshold, and this paper will study image segmentation under multi-threshold based on the maximum entropy value method [5]. Generally, the query in the way real-world systems completes the search for optimality. So, for finding an optimum result of a particular

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## Fire detection and identification system in forest using IoT

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Animal movement from forest areas to residential areas is currently a challenge for the wild life and forest sectors. Forests are losing trees, creating an unfit environment for animals to live. According to research, fire was responsible for 80% of the damage, which can be averted if it is caught early. A system for detecting and warning of forest fires is the proposed project's method of protecting trees. Based on the node MCU platform, IoT devices and sensors may monitor temperature, gas, and fire. In this project, a fire alarm was constructed using a node MCU connected to temperature, gas, and flame sensors as well as a buzzer and LCD. Users will receive the phone number listed in the emulator using GSM. Temperature sensor is used to indicate the high and low temperature reached displayed on Lcd , flame sensor is used to indication of flame range if it is high the forest fire will be detected and will be displayed on LCD. Whenever fire detection is observed message alert will be sent to respective mobiles and the data will be displayed on the web page which can be accessed via internet. The technology used for this design is IOT, Blynk software and GSM module (used for Mobile communication and internet). This makes it easier after the detection and to intimate it to the higher authorities.

**Keywords:** GSM module, Node MCU, IOT (InternetOfThings), Blynk Software.

**1. INTRODUCTION**

Standard insurance predicts that there would be hotspots for wildfires all around the planet. Protectors of the ecological equilibrium of the planet are forests. Unfortunately, a forest fire is typically only discovered after it has consumed a significant amount of land, which makes fighting and controlling it challenging and occasionally impossible. In addition to irreparable harm to the ecology (high levels of smog and carbon dioxide (CO<sub>2</sub>)) in the atmosphere, the repercussions include terrible and irreversible damage to the ecosystem and the atmosphere (30% of the carbon dioxide (CO<sub>2</sub>) in the atmosphere comes from forest fires)[1]. Wildfires can have disastrous long-term implications like changes to local weather patterns, global warming, and the extinction of unique plant and animal species, among other terrible cons. Relationship between meteorological components and forest eruptions. Motivation for fire assessment in remote areas in different environment regions. Many focus areas rely on the remote sensor framework checked by experts around the world suitable for observation and perception of structures that control fires.tasks, e.g. B. fire department, letters System and hoisting, coordination and national reasons, etc.

**2. Historical Background (Literature Survey)****Simultaneous Forest Fire Detection and Analysis with WSN:**

When compared to conventional sensors, these wireless sensors are extremely expensive. When it comes to employing the sensors, there are several technological challenges. are stationed in the wooded area. These sensors are linked together. This is accomplished through the deployment of a neural community approach. The measured data will be accumulated by these deployed sensor-nodes. The data will be delivered to the main node or interface. A cluster head is another name for this major node. The information will be sent to the supervisor or master node by these cluster heads. This master node functions similarly to a computer. This is where the data from the sensors will be processed. The data is gathered and delivered at predetermined intervals. The traffic between the nodes will be reduced as a result of this.

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## A NOVEL TECHNIQUE FOR GLOBAL OPTIMIZATION PROBLEMS IS THE AFRICAN VULTURE OPTIMIZATION ALGORITHM

<sup>1</sup>V.Ganesh, <sup>2</sup>K.Harinatha Reddy, <sup>3</sup>A.Vennela, <sup>4</sup>Jinna Bhavani

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### ABSTRACT

Optimization is a methodology of making a system or design as fully perfect, functional or effective as possible sufficiently. Optimization methods are used for finding solutions that maximize or minimize some study parameters. In Optimization Metaheuristic is a high level heuristic design to generate a procedure that provides good solutions for optimization problems such as incomplete, imperfect information, limiting computer capacity. To solve complex and Multidimensional issues, approximation algorithms have been proposed as a new approach for solving such problems. These are divided into 2 major categories such as Heuristic and Metaheuristic algorithms. Where Heuristic methods are for Local trap and for solving specific optimal problems, where metaheuristic method is used for various challenging and complex optimal problems. Metaheuristic is strive to balance both exploration and exploitation. At beginning this methods benefits from the exploration to produce solutions, later it is transmit to exploitation which improve the accuracy of exploration phase. Metaheuristic is a strategy to guide search problem, continuous, & discrete optimization has grown dramatically. These kind of algorithms are produced by the intelligence and creatures in nature. Recently there were many such kind of metaheuristic algorithms are proposed among them proposed project algorithm is named as "AFRICAN VULTURE OPTIMIZATION ALGORITHM (AVOA)". Which proposed inspired by the African vultures life style . The AVOA algorithm will be implemented in step by step process, and all the required conditions and points are declared in each step of the proposed algorithm according to the basic concepts about vultures. This AVOA algorithm consists of 4 phases such as phase1, phase2, phase3, phase4. Where phase1 is for determining the best vulture in any group, where phase2 is for knowing the rate of starvation of vultures, where phase3 is for exploration and phase4 is for exploitation. By using these phases optimization is held in African vulture optimization algorithm. Hence expecting this "African vulture optimization algorithm" will give superior results than comparing with other proposed algorithm till now.

**Keywords:** Optimization , Approximation algorithms, Metaheuristic , Heuristic, Exploration, Exploitation, African vulture optimization algorithm, African vulture life style, Phases

### 1. INTRODUCTION

In present industrial sector, there were many optimization problems are occurring. These optimization problems will give certain parameters to reach our destination under certain conditions. In present days technology is being developed day by day , many industries are working under such optimization problems rectifying techniques, to produce high quality solutions. For producing such solutions different algorithms are got designed by many scientists, and these algorithms are also designed by watching the behaviour of different animals. Therefore, these algorithms are also got succeeded in producing great results for optimization problems.

There were many existing algorithms and they are divided based upon different methods such as heuristic and metaheuristic methods. Where heuristic is said to be process in which the algorithm is applicable and based upon the specified time complexity and space complexity. Where metaheuristic method is said to be it is an improved

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There were many existing algorithms and they are divided based upon different methods such as heuristic and metaheuristic methods. Where heuristic is said to be process in which the algorithm is applicable and based upon the specified time complexity and space complexity. Where metaheuristic method is said to be it is an improved

## A NOVEL TECHNIQUE FOR GLOBAL OPTIMIZATION PROBLEMS IS THE AFRICAN VULTURE OPTIMIZATION ALGORITHM

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### ABSTRACT

Optimization is a methodology of making a system or design as fully perfect, functional or effective as possible sufficiently. Optimization methods are used for finding solutions that maximize or minimize some study parameters. In Optimization Metaheuristic is a high level heuristic design to generate a procedure that provides good solutions for optimization problems such as incomplete, imperfect information, limiting computer capacity. To solve complex and Multidimensional issues, approximation algorithms have been proposed as a new approach for solving such problems. These are divided into 2 major categories such as Heuristic and Metaheuristic algorithms. Where Heuristic methods are for Local trap and for solving specific optimal problems, where metaheuristic method is used for various challenging and complex optimal problems. Metaheuristic is strive to balance both exploration and exploitation. At beginning this methods benefits from the exploration to produce solutions, later it is transmit to exploitation which improve the accuracy of exploration phase. Metaheuristic is a strategy to guide search problem, continuous, & discrete optimization has grown dramatically. These kind of algorithms are produced by the intelligence and creatures in nature. Recently there were many such kind of metaheuristic algorithms are proposed among them proposed project algorithm is named as "AFRICAN VULTURE OPTIMIZATION ALGORITHM (AVOA)". Which proposed inspired by the African vultures life style . The AVOA algorithm will be implemented in step by step process, and all the required conditions and points are declared in each step of the proposed algorithm according to the basic concepts about vultures. This AVOA algorithm consists of 4 phases such as phase1, phase2, phase3, phase4. Where phase1 is for determining the best vulture in any group, where phase2 is for knowing the rate of starvation of vultures, where phase3 is for exploration and phase4 is for exploitation. By using these phases optimization is held in African vulture optimization algorithm. Hence expecting this "African vulture optimization algorithm" will give superior results than comparing with other proposed algorithm till now.

**Keywords:** Optimization , Approximation algorithms, Metaheuristic , Heuristic, Exploration, Exploitation, African vulture optimization algorithm, African vulture life style, Phases

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## VEHICLE NUMBER PLATE DETECTION ANALYSIS BY USING VARIOUS SMOOTHING FILTERS AND COLOR MODELS

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Number plate detection is an image processing technique that uses the vehicle's number plate (licence plate) to identify it. Vehicle number plate recognition is important in a variety of settings, including the military, government agencies, and so on. In this work, we look at number plate detection utilising a variety of smoothing filters, such as the Gaussian and Bilateral filters, as well as several colour models, such as the HSV and YCBCR colour models. Initially the image is converted into YCBCR image and the converted image is converted into binary image and perform morphological operations, the processed image is filtered through bilateral filter and apply contours to detect the number plate in another analysis we are removing bilateral filter and placing Gaussian filter and observe the changes in other analysis we are using HSV color model and apply same process by using bilateral and Gaussian filters.

### Keywords:

Bilateral filter, Gaussian filter, HSV color model, YCBCR color model, inverted adaptive Gaussian thresholding, MATLAB.

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Automatic Number Plate Detection is a mass surveillance technology that reads licence plates on vehicles using optical characters on an image. As a form of electronic toll collection on payments, and to monitor traffic activity as a red light at an intersection, they are used by various securities, police forces, and as a method of electronic toll collection on payments. This method will take a car image as input and do pre-processing. Pre-processing is used to improve image data by suppressing undesired distortions and enhancing certain visual qualities that are relevant for later processing. Segmentation is applied to the processed image.

In most cases, image segmentation is used to locate objects and boundaries (lines, curves, and so on) in images. Binarization is an image processing technique for detecting edges. Image segmentation can be as simple as thresholding. Thresholding can be used to create binary images from a grey scale image, and the image is then cropped. An extraction method is applied to the cropped image. Morphological image processing is a set of non-linear operations on an image's shape and morphology.

Morphological processes, which rely solely on the relative ordering of pixel values rather than their numerical values, are well suited to the processing of binary images. Edge detection was performed on that morphological image. It will be simple to extract the required section of the image from that softened image. The licence plate will be removed from that photograph, and the number plate will be displayed. The rate of detection of the number plate will be increased as a result of this operation

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# Comprehensive performance analysis of data-fusion aided cooperative cognitive radio network over $\eta - \mu$ fading channel

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**Abstract:** In this paper, analytical performance of efficient soft-data combining schemes (SDCSs) for cognitive radio network (CRN) is investigated. The performance is investigated in the presence of noise and generalized  $\eta - \mu$  fading. In more detail, each CRU senses the PU and reports its sensing information to the fusion center (FC). At FC, different SDCSs, which differ in process of fusing the sensing data, are implemented to make the global decision on the status of a PU. In the present work, first the novel mathematical expressions, subject to SDCS and  $\eta - \mu$  fading are derived. Next, the performance is evaluated through receiver operating characteristics (ROC) and average error rate (AER), considering the significant impact of network and channel parameters. The performance of hard-decision combining schemes (HDCSs) is also studied for comparison purpose. The analysis presented in this paper eliminates the need of analysis of SDCSs over individual fading channels. An optimal sensing threshold and an optimal number of CRUs where AER attains its minimum value are also determined for all HDCSs and SDCSs. Finally, the derived expressions are validated by computer based simulations for several parameter values of the network.

## Nomenclature

$s(t)$	unknown PU signal with energy $E_s$
$n(t)$	additive white Gaussian noise (AWGN) with zero mean
$h$	fading coefficient of the sensing channel
Hypothesis $\mathcal{H}_0$	PU is inactive
Hypothesis $\mathcal{H}_1$	PU is active
$T$	observation interval
$N_{01}$	one-sided noise power spectral density
$u = TW$	time-bandwidth product
$W$	one-sided PU signal bandwidth
$N$	number of CRUs
$k_{\text{opt}}$	optimal number of CRUs under HDCS
$N_{\text{opt}}$	optimal number of CRUs under SDCS
$T_N$	number of terms
$\lambda$	detection threshold
$\lambda_{\text{opt}}$	optimal detection threshold under HDCS
$\lambda^*$	optimal detection threshold under SDCS
$\gamma_s$	instantaneous signal-to-noise ratio (SNR) of the sensing channel
$\bar{\gamma}_s$	average SNR of the sensing channel
$P_f$ or $\bar{P}_f$	probability of false alarm in a CRU
$P_d$ or $\bar{P}_d$	probability of detection in a CRU
$P_m = 1 - P_d$	or probability of missed detection in a CRU
$\bar{P}_m = 1 - \bar{P}_d$	
$\eta$ and $\mu$	generalised fading parameters
$C/W$	ergodic channel capacity
$p(\mathcal{H}_0)$	PU being inactive probability (prior)
$p(\mathcal{H}_1)$	PU being active probability (prior)
$\bar{P}$	average error rate in a CRU
$Q_f$ or $\bar{Q}_f$	cooperative false alarm probability
$Q_d$ or $\bar{Q}_d$	cooperative detection probability
$Q_m = 1 - Q_d$	or cooperative missed detection probability
$\bar{Q}_m = 1 - \bar{Q}_d$	

$Q$	average error rate in FC in the case of the HDCS
$\bar{Q}$	average error rate in FC in the case of the SDCS

## 1 Introduction

Cognitive radio (CR) technology is planned to help the unlicensed users to use the spectrum of licensed users opportunistically when licensed users are not active. Hence, it avoids the conflicts between spectrum scarcity of unlicensed users and unutilised spectrum bands of licensed users [1]. Accurate detection of unutilised spectrum bands and implementation of all the capabilities of a CR are needed in the fifth generation (5G)/sixth generation (6G) technology based wireless networks [2]. Several sensing techniques are developed to find the status of licensed users (either active or inactive). The energy detection method is the simplest sensing technique to detect the status of a licensed user [also called as the primary user (PU)] when information about PU is not known [3]. In a practical scenario, the decision about a PU made by a single CR user (CRU; also called as an unlicensed user) cannot be guaranteed when the CR experiences severe noise plus fading [3–6]. In such cases, cooperative spectrum sensing (CSS) is essential to make a reliable decision on the status of a PU. More precisely, in a CSS scheme, a number of CRUs sense the same PU individually. It is the fact that all CRUs may not experience severe noise or fading. Then, CRUs share their individual-sensing information and cooperatively participate in decision making on the status of the PU [7]. There are several methods to combine the individual-sensing information, these methods can be implemented at a common control centre for all CRUs called as fusion centre (FC). Hard-decision combining schemes (HDCSs) and soft-data combining schemes (SDCSs) are the combining methods that are implemented at the FC [8, 9]. For efficient and reliable communications, an optimal combining scheme is developed with low cost and fewer complexities for minimising the average error rate (AER) [10].

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## DESIGN AND DEVELOP AN INTELLIGENT SYSTEM FOR PREDICTING HEART DISEASE USING MACHINE LEARNING ALGORITHM

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### ABSTRACT

Heart attack is a word used to describe a wide range of heart-related medical disorders. The evaluation of vast amounts of data and comparison of information that can be used to forecast, prevent, and manage conditions like heart attacks are crucial to understanding heart (cardiovascular) disorders. This study's primary goal is to create an intelligent system employing machine learning methods including Naive Bayes, KNN, and Random Forest Decision Tree. The user responds to predetermined questions in this web-based application. The globe uses data analytics for its beneficial use in managing, regulating, and combating massive data volumes. It can be used to predict, prevent, and manage cardiovascular diseases with great effectiveness. To solve this we aims to implement the Data Analytics based on SVM and Genetic Algorithm to diagnosis of heart diseases. This result reveal, which Algorithm is best, optimized Prediction Models. It can answer complex queries for diagnosing heart disease and thus assist healthcare practitioners to make intelligent clinical decisions, which traditional decision support systems cannot. By providing effective treatments, it also helps to reduce treatment costs.

**Keywords:** SVM, KNN, Cardiovascular disease etc.

### INTRODUCTION

A crucial component of the human body is the heart. It supplies blood to every organ and bone in our body. If it fails to work properly, the brain and several other organs will stop working, and the person will die within a few minutes. The prevalence of numerous heart-related disorders is rising as a result of lifestyle changes, work-related stress, and poor eating habits. Around the world, heart illnesses have emerged as one of the leading causes of death. 17.7 million people worldwide die each year from heart-related disorders, or 31% of all deaths, according to the World Health Organization. Heart-related illnesses are becoming the leading cause of death in India as well. In India, heart disease claimed 1.7 million lives in 2016, according to the 2016 Global Burden of Disease Report, released on September 15, 2017. Heart related diseases increase the outlay on health care and reduce the efficiency of an individual. Estimates made by the World Health Organization (WHO), suggest that India have lost up to \$237 billion, from 2005- 2015, due to heart related or cardiovascular diseases. Thus, reasonable and accurate prediction of heart related diseases is very important. Medical organizations, all around the world, collect data on various health related issues. These data can be oppressed using various machine-learning techniques to gain useful understandings. But the data collected is very massive and, many a times, this data can be very noisy. These datasets, which are too devastating for human minds to comprehend, can be easily explored using various machine-learning techniques. Thus, these algorithms have become very useful, in recent times, to predict the presence or absence of heart related ailments accurately.



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## ANALYSIS ON MODELS FOR MACHINE LEARNING TO DETECT THE SECURITY LEVEL OF DIFFERENT CRYPTOSYSTEMS

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Recent developments in multimedia technology have made the security of digital data a vital concern. To address the shortcomings of the current security mechanisms, researchers frequently concentrate their efforts on altering the existing protocols. However, during the past few decades, a number of proposed encryption algorithms have been shown to be insecure, posing a major security risk to sensitive data. It is crucial to use the best encryption method to defend against such attacks, but which algorithm is best in a certain situation will depend on the type of data being secured. However, evaluating various cryptosystems one at a time to determine the optimal choice can consume a significant amount of processing time. We provide a security level detection approach for image encryption algorithms by incorporating a support vector machine (SVM) for quick and precise selection of relevant encryption techniques. In this work, we also create a data set using standard encryption security parameters, such as entropy, contrast, homogeneity, peak signal to noise ratio, mean square error, energy, and correlation. These parameters are taken as features extracted from different cipher images. Dataset labels are divided into three categories based on their security level: strong, acceptable, and weak. To evaluate the performance of our proposed model, we have calculated accuracy and our results demonstrate the effectiveness of this SVM-supported system.

**Keywords:** DDoS attack, machine learning, Deep learning, Volumetric attacks, protocol attacks.

### INTRODUCTION

Due to the exponential increase in multimedia data transmissions through unsecure networks, security has become a prominent study area (most notably the Internet). To shield data from snoopers and unauthorized users, several researchers have turned to creating novel encryption techniques. When encrypting digital photos, diffusion and misunderstanding are two essential components (also known as scrambling). According to a hypothesis put forth by Claude Shannon, a cryptosystem with confusion and diffusion techniques can be regarded as secure. On digital photos, the scrambling process can be applied directly to the pixels or to the rows and columns, whereas diffusion modifies the original pixel values. In other words, the replacement process replaces each distinct pixel value with the value of the S-unique box. However, data transmission in an encrypted format is insufficient to preserve its privacy. Although the information which is to be transmitted is in encrypted form, it can still be visualized by unauthorized users due to the weak security of the encryption algorithm. The security level of the encryption algorithm used to encrypt the image has a significant impact on its robustness. The plain image will be entirely encrypted using a highly strong encryption method, allowing it to withstand attacks on its integrity, secrecy, and availability. Along with security, temporal complexity is another key element to consider when choosing an encryption technology. Because different types of data have different security priorities, choosing a cryptosystem is dependent on the nature of the application to be encrypted. As the image encryption algorithm is very important, we propose a security level detection approach for image encryption algorithms by incorporating a support vector machine (SVM).

We have categorized the security of encryption algorithms into three different levels (strong, moderate and weak) based on standard security parameters of the encryption algorithms. Below is the detail of how we divided the encryption algorithms into three said security levels based on the security parameters such as entropy, homogeneity, contrast, correlation, energy, PSNR and MSE.

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Recent developments in multimedia technology have made the security of digital data a vital concern. To address the shortcomings of the current security mechanisms, researchers frequently concentrate their efforts on altering the existing protocols. However, during the past few decades, a number of proposed encryption algorithms have been shown to be insecure, posing a major security risk to sensitive data. It is crucial to use the best encryption method to defend against such attacks, but which algorithm is best in a certain situation will depend on the type of data being secured. However, evaluating various cryptosystems one at a time to determine the optimal choice can consume a significant amount of processing time. We provide a security level detection approach for image encryption algorithms by incorporating a support vector machine (SVM) for quick and precise selection of relevant encryption techniques. In this work, we also create a data set using standard encryption security parameters, such as entropy, contrast, homogeneity, peak signal to noise ratio, mean square error, energy, and correlation. These parameters are taken as features extracted from different cipher images. Dataset labels are divided into three categories based on their security level: strong, acceptable, and weak. To evaluate the performance of our proposed model, we have calculated accuracy and our results demonstrate the effectiveness of this SVM-supported system.

**Keywords:** DDoS attack, machine learning, Deep learning, Volumetric attacks, protocol attacks.

### INTRODUCTION

Due to the exponential increase in multimedia data transmissions through unsecure networks, security has become a prominent study area (most notably the Internet). To shield data from snoopers and unauthorized users, several researchers have turned to creating novel encryption techniques. When encrypting digital photos, diffusion and misunderstanding are two essential components (also known as scrambling). According to a hypothesis put forth by Claude Shannon, a cryptosystem with confusion and diffusion techniques can be regarded as secure. On digital photos, the scrambling process can be applied directly to the pixels or to the rows and columns, whereas diffusion modifies the original pixel values. In other words, the replacement process replaces each distinct pixel value with the value of the S-unique box. However, data transmission in an encrypted format is insufficient to preserve its privacy. Although the information which is to be transmitted is in encrypted form, it can still be visualized by unauthorized users due to the weak security of the encryption algorithm. The security level of the encryption algorithm used to encrypt the image has a significant impact on its robustness. The plain image will be entirely encrypted using a highly strong encryption method, allowing it to withstand attacks on its integrity, secrecy, and availability. Along with security, temporal complexity is another key element to consider when choosing an encryption technology. Because different types of data have different security priorities, choosing a cryptosystem is dependent on the nature of the application to be encrypted. As the image encryption algorithm is very important, we propose a security level detection approach for image encryption algorithms by incorporating a support vector machine (SVM).

We have categorized the security of encryption algorithms into three different levels (strong, moderate and weak) based on standard security parameters of the encryption algorithms. Below is the detail of how we divided the encryption algorithms into three said security levels based on the security parameters such as entropy, homogeneity, contrast, correlation, energy, PSNR and MSE.

## ANALYSIS ON MODELS FOR MACHINE LEARNING TO DETECT THE SECURITY LEVEL OF DIFFERENT CRYPTOSYSTEMS

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## SUPER-PCA-BASED MACHINE LEARNING FRAMEWORK FOR HYPERSPPECTRAL IMAGE CLASSIFICATION

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### Abstract

The satellite photos containing hyperspectral imagery (HSI) are to be further processed for use in any applications. The most crucial and necessary stage requires the classification of hyper-spectral images in order to derive map coordinates from the image co-ordinates. The ground control points (GCPs) for this method must be manually retrieved from the remotely sensed images based on the ground truth values, which takes time. In order to classify the multi-temporal HSI satellite data, super pixel based principal component analysis (Super -PCA) is suggested in this study. This method will automatically extract GCPs and will also shorten the processing time, both of which will boost accuracy. In satellite data feature extraction, PCA is a popular algorithm, however it extracts features relatively slowly. To overcome PCA drawback, Super-PCA is proposed and implemented only for images which has less features but not implemented in satellite images. The Super -PCA is improved in phase angle to be used in satellite data in this research for extracting features for six levels in multi-temporal HSI satellite imagery. Support Vector Machine (SVM) is generally used for non-linear multi-class classification. The accuracy of SVM is based on the kernel selection. Hence Fuzzy SVM (F-RVM) is proposed for kernel selection based on the resolution and intensity of the features in the satellite imagery. The results are compared with various traditional techniques and show the better performance.

**Keywords:** HSI, Super -PCA, SVM.

### 1. Introduction

Due to the rotation of the satellite, rotation of the planet, calibrations of the sensors, atmospheric conditions, projection direction, etc., the remotely sensed HSI data is subject to different distortions [1]. Due to these distortions, the raw data collected by remote sensing satellites contains an excessive amount of mistakes and noise, which lowers the quality of the image that is captured. In order to remove distortions and noise, satellite images that are directly obtained from distant satellites are pre-processed [2]. Therefore, in order to solve this issue, current developments in remote sensing are directed occasionally examination of the earth's surface for the forecasting of natural disasters. In addition, change detection is very important for keeping track of the state of the environment. Most of the real time applications with respect to military, daily-life, etc. are based on the remotely sensed data. Remote sensing could be defined as the process by which the information about an object or place or area is acquired without physically having contact with the object or place or area. This is categorized into active remote sensing and passive remote sensing based on the data which is gathered. In passive remote sensing, there are sensors which are usually termed as passive sensors which collect radiation emitted or that is reflected by the object or the area. Usually, passive sensors are designed to measure the sunlight which is reflected. Few examples for passive remote sensing are film photography, infrared, charge-coupled devices [3], radiometers, etc. Active remote sensing is one where they emit

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## A STUDY ON CONVOLUTIONAL NEURAL NETWORKS FOR PLANT LEAF DISEASE DETECTION

<sup>1</sup>CH.Sangeetha, <sup>2</sup>M.Lavanya, <sup>3</sup>A.Vijaya Kumar, <sup>4</sup>M Sai Deexita

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### ABSTRACT

This job primarily used some Deep Learning techniques to identify the early stages of a plant's disease. We are aware that India's agricultural sector generates a substantial amount of revenue. Bug damage to plants and harvests has an impact on the nation's horticulture production. Sickesses and irritant infestations practically cost the world's crop produce 40% of its output. In farming, the early location of illnesses is important for a good crop yield. The Machine Learning methodology is one of the methods for detecting plant diseases. Our approach progresses toward the notion of deep learning-based brain networks.

### INTRODUCTION

India is a nation where a larger portion of the population is heavily dependent on the countryside. The plant's vulnerability to diseases is one of the main problems with gardening. By continuously inspecting plants over a long period of time, experts can identify objective information regarding a plant's diseases. Illnesses do have negative impacts on plants, which have an impact on their normal growth. In terms of the farming system, India has come in eighth. According to the evaluation, 56.6% of people work mostly in agriculture.

Horticultural innovation has spread quickly across life in multiple directions. Ranchers started using extended social practices and agricultural contributions with work-escalated initiatives after the green upset to boost the harvest yield potential per unit of land.

Plants act as a spine to support the climate. Plants truly do experience the ill effects of sicknesses, which influence the typical development of plants. These illnesses influence total plant development including leaf, bloom, stem, and organic product. Discovery of such plant sicknesses is a significant assignment to perform. More often than not the it are tedious and bulky to exist ways to deal with sickness distinguishing proof. Thus, to screen plant sickness at a beginning phase, the utilization of a few programmed techniques can be very gainful.

Tomato is the most widely recognized vegetable utilized across India. The tomato crop development region in India ranges around 3,50,000 hectares roughly and the creation amounts generally summarize to 53,00,000 tones, making India the third-biggest tomato maker on the planet. Sickness impacted plants comprise 10-30% of absolute harvest misfortune.

This work supplements agriculturists to merge the instinctive choice with respect to the acknowledgment of plant infection by utilizing profound learning conventional model carried out through sensor flow. The calculation utilized at the center of the profound learning model is the Convolutional Neural Networks (CNN or ConvNet) is a kind of feed-forward counterfeit brain network in which the availability design between its neurons is roused by the association of the creature visual cortex. The model characterizes pictures of any plant into sick and solid ones. The dataset utilized for this work is comprised of tomato plants photos, subsequent to expanding those utilizing pivots at different points.

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## An Automatic online User data verification and comparison from E-Government using AI

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In a rising number of disciplines, artificial intelligence (AI) has recently improved state-of-the-art outcomes. However, it continues to encounter a number of issues that limit its deployment in e-government applications, both to enhance e-government interactions with individuals and e-government systems. In this article, we discuss the problems with e-government systems and suggest a paradigm for automating and facilitating e-government functions. In particular, we present a framework for the management of electronic resources for government information. The second step is to create a collection of deep learning models with the goal of automating various e-government services. Third, we suggest an intelligent e-government platform architecture that enables the creation and execution of AI e-government applications. Our primary objective is to advance the existing state of AI by using reliable AI methodologies of e-government services in order to minimize processing times, reduce costs, and improve citizens' satisfaction.

**Keywords:** Artificial intelligence, deep learning, E-government, web services.

### INTRODUCTION

Artificial intelligence (AI) has been around for a while in a variety of theoretical forms and complex systems, but it has only recently been made possible by breakthroughs in computing power and massive data to achieve spectacular outcomes in an expanding range of disciplines. Computer vision, medical applications, natural language processing, reinforcement learning, and a number of other fields, for instance, have all greatly benefited from AI. The ability of a computer to mimic the intelligence of human behavior while enhancing its own performance is known as artificial intelligence (AI). AI, which is not just robotics but rather the intelligent behavior of an autonomous machine that characterizes the machine's mind rather than its body, is capable of driving a car, playing video games, and carrying out a variety of complex tasks. AI is a field that falls at the intersections of several other domains, including Machine Learning, Deep Learning, Natural Languages Processing, Context Awareness, and Data Security and Privacy. Figure 1 illustrates the intersections and relationship of the AI field with related fields.

Machine Learning (ML) is the ability of an algorithm to learn from prior data in order to produce a smart behavior and make correct decisions in various situations that it has never faced before. ML algorithms are enabled by training computational model, which is the process of exposing an algorithm to a large dataset (e.g., citizens' demographics) in order to predict future behaviors (e.g., employment rates). The process of learning from prior datasets is known as a supervised learning. Unlike traditional ML algorithms, Deep Learning, a subfield of ML, has emerged to overcome the limitations of prior ML algorithms. Deep learning can be defined as a mapping function that maps raw input data (e.g., a medical image) to the desired output (e.g., diagnosis) by minimizing a loss function using some optimization approach, such as stochastic gradient descent (SGD). Deep learning algorithms, inspired by the neural networks in the human brain, are built with a large

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Machine Learning (ML) is the ability of an algorithm to learn from prior data in order to produce a smart behavior and make correct decisions in various situations that it has never faced before. ML algorithms are enabled by training computational model, which is the process of exposing an algorithm to a large dataset (e.g., citizens' demographics) in order to predict future behaviors (e.g., employment rates). The process of learning from prior datasets is known as a supervised learning. Unlike traditional ML algorithms, Deep Learning, a subfield of ML, has emerged to outcome the limitations of prior ML algorithms. Deep learning can be defined as a mapping function that maps raw input data (e.g., a medical image) to the desired output (e.g., diagnosis) by minimizing a loss function using some optimization approach, such as stochastic gradient descent (SGD). Deep learning algorithms, inspired by the neural networks in the human brain, are built with a large

## Deep learning and multiclass SVM algorithms for finding and identifying a missing child

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### ABSTRACT

In this project, members of the public can post pictures of children that appear suspicious along with notes and landmarks. The image will be automatically compared to the repository's registered images of the missing child. The input child image is categorized, and the missing children database will be searched for the photo that matches the input child image the best. In order to do this, a deep learning model is trained to accurately identify the missing child using the facial image uploaded by the public and the missing child image database that is provided. Here, face identification is accomplished using the Convolution Neural Network (CNN), a very successful deep learning technology for image-based applications. With the aid of a trained CNN model, face descriptors are derived from the photos. Face deep architecture for VGG. Compared with normal deep learning applications, our algorithm uses convolution network only as a high level feature extractor and the child recognition is done by the trained SVM classifier. Choosing the best performing CNN model for face recognition, VGG-Face and proper training of it results in a deep learning model invariant to noise, illumination, contrast, occlusion, image pose and age of the child and it outperforms earlier methods in face recognition based missing child identification.

### INTRODUCTION

Any nation's future is dependent on how well its children are raised. India is the second most populated nation in the world, and a sizable portion of its population is made up of children. But sadly, a significant number of kids go missing every year in India for a variety of causes, such as kidnapping or abduction, runaways, trafficking kids, and lost kids. The fact that, despite an average of 174 children going missing every day in India, half of them are still unaccounted for is incredibly troubling. Children who disappear may be used and mistreated in a variety of ways. The Ministry of Home Affairs (MHA) highlighted the National Crime Records Bureau (NCRB) report in the Parliament (LS Q no. 3928, 20-03-2018), more than one lakh children (1,11,569 in actual numbers) were reported to have gone missing till 2016, and 55,625 of them remained untraced till the end of the year. Many NGOs claim that estimates of missing children are much higher than reported. Mostly missing child cases are reported to the police. The child missing from one region may be found in another region or another state, for various reasons. So even if a child is found, it is difficult to identify him/her from the reported missing cases. A framework and methodology for developing an assistive tool for tracing missing child is described in this paper. An idea for maintaining a virtual space is proposed, such that the recent photographs of children given by parents at the time of reporting missing cases is saved in a repository. The public is given provision to voluntarily take photographs of children in suspected situations and uploaded in that portal. Automatic searching of this photo among the missing child case images will be provided in the application. This supports the police officials to locate the child anywhere in India. When a child is found, the photograph at that time is matched against the images uploaded by the Police/guardian at the time of missing. Sometimes the child has been missing

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## IoT-enabled Cyber-Physical Systems: Approaching Screening and Identification of Cyber-Attacks

<sup>1</sup>Dr. Yadu Singh, <sup>2</sup>S.Varalakshmi, <sup>3</sup>B.Raghupathi, <sup>4</sup>Krishnaveni

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### ABSTRACT

IoT-enabled Cyber-Physical Systems: Toward Detection and Attribution of Cyber-Attacks Cyberphysical systems (CPS) that are Internet of Things (IoT) enabled might be difficult to secure since security measures designed for general information / operational technology (IT / OT) systems may not work as well in a CPS environment. Consequently, this research provides a two-level ensemble attack detection and attribution framework created for CPS, and more particularly in an industrial control system (ICS). For identifying assaults in unbalanced ICS environments, a decision tree integrated with an unique ensemble deep representation learning model is created at the first level. An ensemble deep neural network is created for assault attribution at the second level. Using real-world datasets from the gas pipeline and water treatment system, the suggested model is assessed. Results show that the suggested model works better other competing approaches with similar computational complexity.

**Keywords:** - Cyber-attacks, Deep representation learning, Cyber threat detection, Cyber threat attribution

### 1. INTRODUCTION

Cyber-physical systems (CPS) are becoming more and more integrated with Internet of Things (IoT) technology, including key infrastructure sectors like dams and utilities plants. IoT devices, also known as Industrial IoT or IIoT in these contexts, are frequently a component of an Industrial Control System (ICS), which is responsible for the safe operation of the infrastructure. ICS can be widely defined to cover systems that use programmable logic controllers (PLC) and Modbus protocols, distributed control systems (DCS), and supervisory control and data acquisition (SCADA) systems. However, by connecting ICS or IIoT-based systems to public networks, their attack surfaces and chances of being targeted by cyber criminals grow. One high-profile example is the Stuxnet campaign, which reportedly targeted Iranian centrifuges for nuclear enrichment in 2010, causing severe damage to the equipment [1], [2]. Another example is that of the incident targeting a pump that resulted in the failure of an Illinois water plant in 2011 [3]. BlackEnergy3 was another campaign that targeted Ukraine power grids in 2015, resulting in power outage that affected approximately 230,000 people [4]. In April 2018, there were also reports of successful cyber-attacks affecting three U.S. gas pipeline firms, and resulted in the shutdown of electronic customer communication systems for several days

Although security solutions developed for information technology (IT) and operational technology (OT) systems are relatively mature, they may not be directly applicable to ICSs. For example, this could be the case due to the tight integration between the controlled physical environment and the cyber systems. Therefore, system-level security methods are necessary to analyze physical behaviour and maintain system operation availability [1]. ICS security goals are prioritized in the order of availability, integrity, and confidentiality, unlike most IT/OT systems (generally prioritized in the order of confidentiality, integrity, and availability) [5]. Due to close coupling between variables of the feedback control loop and physical processes, (successful) cyber-attacks on ICS can result in severe and potentially fatal consequences for the society and our environment. This reinforces the importance of designing extremely robust safety and security measurements to detect and prevent intrusions targeting ICS.

### RELATED WORK

We develop a novel two-phase ensemble ICS attack detection method capable of detecting both previously seen and unseen attacks. We will also demonstrate that the proposed method outperforms other competing

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**MULTIPLE ACCESS CONTROL FOR STORAGE AND SHARING OF CLOUD-BASED DATA****<sup>1</sup>P.Satish Reddy, <sup>2</sup>G.Venkatesh, <sup>3</sup>Asif Ahmed Algur, <sup>4</sup>Sushma**<sup>4</sup> UG Student, <sup>1,2,3,4</sup> Department of Computer Science, Kasireddy Narayanreddy College Of Engineering And Research, Hyderabad**ABSTRACT**

Due to its effective and affordable management, cloud-based data storage has recently attracted growing interest from academia and industry. Since services are delivered over an open network, it is critical for service providers to adopt secure data storage and sharing mechanisms to protect user privacy and the confidentiality of data. The most popular technique for preventing the compromise of sensitive data is encryption. The actual necessity for data management, however, cannot be fully met by merely encrypting data (for instance, using AES). Additionally, a strong access control over download requests must be taken into account to prevent Economic Denial of Sustainability (EDoS) assaults from being performed to prevent users from using the service. This article examines the dual access control, in the context of cloud-based storage, in the sense that we design a control mechanism over both data access and download request without loss of security and efficiency. Two dual access control systems are designed in this paper, where each of them is for a distinct designed setting. The security and experimental analysis for the systems are also presented.

**INTRODUCTION**

Cloud-based storage has received a lot of interest in recent years from both academia and business. Due to its extensive list of advantages, which includes access freedom and the lack of local data administration, it may be widely employed in many Internet-based commercial applications (such as Apple iCloud). Nowadays, a growing number of people and businesses prefer to outsource their data to faraway clouds in order to avoid having to upgrade their local data security breaches involving outsourced data. Outsourced data may need to be subsequently shared with others in many practical scenarios. Alice, a Dropbox member, might share pictures with her friends. Without using data encryption, prior to sharing the photos, Alice needs to generate a sharing link and further share the link with friends. Although guaranteeing some level of access control over unauthorized users (e.g., those are not Alice's friends), the sharing link may be visible within the Dropbox administration level (e.g., administrator could reach the link). Since the cloud (which is deployed in an open network) is not be fully trusted, it is generally recommended to encrypt the data prior to being uploaded to the cloud to ensure data security and privacy. One of the corresponding solutions is to directly employ an encryption technique (e.g., AES) on the outsourced data before uploading to cloud, so that only specified cloud user (with valid decryption key) can gain access to the data via valid decryption. To prevent shared photos being accessed by the "insiders" of the system, a straightforward way is to designate the group of authorized data users prior to encrypting the data. In some cases, nonetheless, Alice may have no idea about who the photo receivers/users are going to be. It is possible that Alice only has knowledge of attributes w.r.t. photo receivers. In this case, traditional public key encryption (e.g., Paillier Encryption), which requires the encrypt or to know who the data receiver is in advance, cannot be leveraged. Providing policy-based encryption mechanism over the outsourced photos is therefore desirable, so that Alice makes use of the mechanism to define access policy over the encrypted photos to guarantee only a group of authorized users is able to access the photos. In a cloud-based storage service, there exists a common attack that is well-known as resource-exhaustion attack. Since a (public) cloud may not have any control over download request (namely, a service user may send unlimited numbers of download request to cloud server), a malicious service user may launch the denial-of-service (DoS)/distributed denial-of-service (DDoS) attacks to consume the resource of cloud storage service server so

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## Characterization of ultrasonic speeds in terms of the FLT, CFT, Nomoto's relation, and the optimal blend of Van Dael

<sup>1</sup>K Ravi, <sup>2</sup>Yamini Saraswathi, <sup>3</sup>P Siva Reddy, <sup>4</sup>Dodla Raghavendra Reddy

<sup>1,2,3</sup> Assistant Professor, <sup>4</sup>UG Student, <sup>1,2,3,4</sup> Department of Chemistry, Kasireddy Narayanreddy college of engineering and Research, Hyderabad

### Abstract

At 303.15 K, thermodynamic experiments of binary liquid mixes of benzene and 2,3-dichloro pentane were conducted. These studies included measurements of density, specific gravity, ultrasonic speed, excess molar volume, and enthalpy. From measurements of density and ultrasonic speed, thermodynamic characteristics such isentropic compressibility ( $k_s$ ), intermolecular free length (Lf), and relative association (RA) have been estimated. The Redlich-Kister polynomial equation has been fitted using the excess thermodynamic functions. Jacobson Free Length Theory (FLT), Schaaff's Collision Factor Theory (CFT), Nomoto's relation, and Van Dael's ideal mixture relation have all been used to analyze the experimental ultrasonic speeds. Intermolecular Free Length (Lf) and available volume ( $V_a$ ) have been calculated from FLT, CFT, and the thermoacoustic approach. It is observed that density and specific gravity increases and ultrasonic speed, isentropic compressibility and intermolecular free length decreases with the mole fraction of 2,3-dichloro Pentane. It is found that intermolecular interaction present between binary liquid mixtures were stronger than pure solvent-solvent interactions.

**Keywords:** Ultrasonic speed; Excess Molar Volume; Benzene; 2,3-dichloro Pentane.

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The study of the physicochemical behavior of binary and multi component liquid mixtures benefits from the measurement of thermodynamic and acoustic characteristics. To verify the theories of solutions, create separation processes and tools, and for various industrial uses, extra parameters of liquid systems, such as molar volumes, are needed. Colorless and very combustible, benzene has a pleasant aroma. It is mostly utilized as a precursor to powerful compounds, including the billion kilogram-scale producer of pentane benzene. Due to its high octane rating, it makes up a small percentage of gasoline, which is an important ingredient. Chemically speaking, 2,3-dichloro Ethylene dichloride (EDC), pentane's former name, is a chlorinated hydrocarbon that is mostly utilized to produce vinyl chloride monomer (chloroethene), the major precursor for PVC production. It is a colorless liquid with a chloroform-like odor. 2,3-Dichloro pentane is also used generally as an intermediate for other organic chemical compounds and as a solvent. Thus, a study of physical properties data on the binary mixture containing 2,3-Dichloro pentane and benzene has attracted considerable interest in the literature (Aminabhavi and Banerjee, 1998; Haijun et al., 1994; Sandhu and Singh, 1992). Thus, 2,3-Dichloro pentane in benzene mixed solvent would enable us to have a large number of solvents with appropriate physico-chemical properties, which can be used for a particular chemical process. Moreover, literature survey indicates that no ultrasonic study on this binary system has been reported at 273.15 K. Therefore, present study was undertaken in order to have deeper understanding of the inter molecular interaction between the components of the above binary liquid mixture. Thus, a study of thermodynamic properties data on the binary mixture of 2,3-Dichloro pentane in benzene has attracted considerable interest in our present study. Research workers in the past



## Characterization of ultrasonic speeds in terms of the FLT, CFT, Nomoto's relation, and the optimal blend of Van Dael

<sup>1</sup>K Ravi, <sup>2</sup>Yamini Saraswathi, <sup>3</sup>P Siva Reddy, <sup>4</sup>Dodla Raghavendra Reddy

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## A balanced network for Maximum Capacity of Networks in Tree Structures using optimizing technique

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### Abstract

One of the most crucial data structures for systems decision-making is a tree. A non-linear data structure is a tree. Optimizing non-linear functions of variables known as objective functions is required for a tree issue. The overall outflow from source node to sink node is maximized by the goal function. Using tree structures, we shall demonstrate a network's maximum capacity.

**Keywords** – capacity, Network, Tree, Source Node, Sink Node

### INTRODUCTION

A Flow Network is a basic linked, weighted, Directed Graph  $G$ . if every Directed edge in  $G$  has a weight that is a non-negative value. This quantity, which is labeled as  $C_{ij}$  for the edge directed from vertex  $i$  to vertex  $j$ , in a flow network reflects the edge's capacity. A highly useful and natural tool in combinatorial operations research is the tree. In such a flow network, the main challenge is to either maximize flow or reduce the cost of a prescribed flow. The maximum flow minimum-cut theorem applies to a flow network with a single source and one drain, as stated. A rooted tree is a tree in which one vertex can be distinguished from every other vertex.

### RELATED WORK

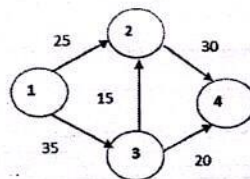


Fig. 1. Weighted Graph

A partition of the node into two sets  $S$  and  $T$ . The origin node must be in  $S$  and the Destination node must be in  $T$ .

Cut 1:

Where  $S_1 = \{1\}$  and  $T_1 = \{2,3,4\}$

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= 60

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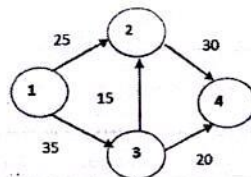


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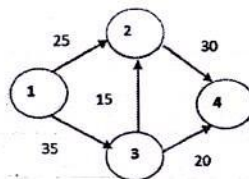


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## ANALYSIS ON UTILIZING EXCESS ULTRASONIC AND DIELECTRIC SETTINGS, COMPLEX FORMATION AMONG ALLYL AMINE (AA) AND 2-METHOXY ETHANOL (2-ME)

<sup>1</sup>Dali Sai Bhavani, <sup>2</sup>T Mamatha, <sup>3</sup>L Rajitha, <sup>4</sup>Muthyala Swetha

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### Abstract

Information on material dielectric and ultrasonic behaviour provides better insight into the choice of solid and liquid insulating materials. The excess characteristics of liquid mixes are discovered to be more responsive to intermolecular interaction between the constituent components. The degree of the contact between dissimilar molecules determines the sign and magnitude of the excess characteristics. Two liquid mixes' densities, viscosities, and ultrasonic velocities The relationship between Allyl Amine (AA) and 2-ethoxy ethanol (2-EE) has been studied at room temperature at a fixed frequency (2 MHz). When Allyl Amine (AA) is combined with 2-Methoxy Ethanol, the liquid dielectric constant ( $\epsilon'$ ) and dielectric loss ( $\epsilon''$ ) have been evaluated using Surber's approach at a single microwave frequency 9.85 GHz for varying mole fractions of AA. The ultrasonic velocity (U), viscosity( $\eta$ ) and density ( $\rho$ ), dielectric constant ( $\epsilon'$ ) are used to estimate acoustic and dielectric parameters along with their excess values. Ultrasonic and Dielectric parameters are being used to explain the formation of complexes in the system.

### Keywords

Ultrasonic velocity, Molecular interaction, Complex formation, X-band microwave bench, Allyl Amine (AA), 2-Methoxy Ethanol (2-ME)

### Introduction

The nonlinear fluctuation of ultrasonic velocity and associated acoustic and excess parameters is connected to the physiochemical characteristics of liquid mixtures. In 2004 (Jerie K.), (M. I. Alaraguppi. 2006) (2012) Sahu S. et al. (2013) Gangwar Munendra Kumar et al. Binary mixtures' composition and the development of complexes through molecular interaction were revealed by dielectric analysis. When molecules create complexes, their features are altered.

The current work focuses on the binary liquid combination of AA and 2-EE's acoustic and dielectric characteristics. Both are polar, with 2-EE acting as a solvent and AA as the solute. 2-EE is firmly connected by an intermolecular hydrogen bond because it is a good proton donor and acceptor.

The paper focused on the molecular interaction between binary mixtures of polar liquids. The possible formation of AA and 2-ME complex may be due to molecular association between these liquids.

### Material And Methods

In the present study allyl amine and 2-Methoxy Ethanol of AR grade were procured from Across, Qualigen, Merck and S.D. fine chemical, Mumbai respectively and used without further purification. Samples of solution with different mole fractions of Allylamine in 2-Methoxy Ethanol were prepared. The density ( $\rho$ ), viscosity ( $\eta$ ) and ultrasonic velocity (U) of pure components and their mixtures were measured using pycnometer, Ostwald's viscometer and ultrasonic frequency interferometer model No. M-83 provided by Mittal Enterprises, New Delhi, India, respectively. Acoustic parameters were computed according to R.S. Kawale et al ; 2015. The refractive indices for Sodium-D-lines were measured by Abbe's Refractometer. The Dielectric constant measurements were carried out from the X-

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CHARACTERIZATION AND PREPARATION OF DIAZONIUM SALT BY USING IR,  
UV AND NMR SPECTRA

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**Abstract**

By combining 2-amino-5-nitro pyrimidine with sodium nitrite and sulfuric acid in the presence of water, diazonium salt was created. Up to 50 degrees Celsius was maintained. To finish the diazotization, the solution was held for 15 minutes and occasionally stirred. After keeping the 8-hydroxy-4-methylcoumarin solution in 20ml of 10% sodium hydroxide solution at 0° to 50°C for an hour, diazonium salt was added. Up to pH 5 or 6, the pH remained maintained. five-(5-nitro pyrimidinylazo) eight- (1-hydroxy hexyl oxy) - By heating up 5-methylcoumarin, 4-methylcoumarin was created (5-nitro pyrimidinylazo) -8-hydroxy-4-methyl coumarin with 1-chloro-6-hydroxy hexane for 20 hours in the presence of potassium hydroxide and potassium iodide. The 5-(5-nitro pyrimidinyl azo) was treated to create the vinyl monomer. -8-(1-hydroxy hexyl oxy)-4-methyl coumarin in the solvent medium of THF with methacryloyl chloride. Lastly, the copolymer was synthesized by the treatment of vinyl monomer with MMA in presence of radical initiator AIBN in the solvent medium of DMF at 60°C for 2 days. The monomer and copolymer were characterized by IR, UV and NMR spectra.

**Keyword:**

5-(5-nitro pyrimidinylazo)-8-hydroxy-4-methyl coumarin, 5-(5-nitro pyrimidinylazo)-8-(1-hydroxy hexyloxy)-4-methyl coumarin, vinyl monomer, copolymer

**Introduction**

Due to their utility in several optical domains, aromatic azopolymers have seen increased utilization in recent years. Following the discovery of the photorefractive property of organic compounds, a number of polymers containing carazole have gained interest due to their photo-refractivity. These polymers' side chains, which have photoconductive and electro-optic capabilities, might be thought of as possible materials for photorefractive applications. Because the azobenzene group is integrated into the polymer, the azo benzene chemistry continues to create unanticipated phenomena, and in this regard, the photo isomerization events might have unexpected potential outcomes. It is widely known that the capability of constructing several variable spacers between the azo group and the main chain in polymer materials containing carbazole might boost the order degrees as well as azo group becomes much decoupled from the main chain motion.

The photorefractive polymers with carbazole ring and azomoieties in the side chain have all the necessary elements for photorefractivity properties (electro-optic chromophore and charge trappers). The azocontaining carbazole groups provided both the photoconductivity and non-linear optical (NLO) activity, and the aliphatic chain attached on the nitrogen atom of the carbazole ring acts as a spacer. Hence, the photorefractive polymer exhibit equally photoconductivity and optical non-linearity. They have concerned substantial interest due to their potential applications in optical computing, optical correlation, 3D data or image storage.

The ability of non-linear optical materials to transmit process and store information forms the basis of emerging optoelectronic and photonic technologies. Organic chromophore containing polymers, in which the refractive index can be controlled by light or an electric field, are expected to play an important role. NLO is an important component of photorefractive system. Organic moieties with delocalized pi-electrons distribution have been extensively investigated for their potential applications in optical switching and optical power limiting, each which require large and fast non-linearities for the purpose. The NLO

## CHARACTERIZATION AND PREPARATION OF DIAZONIUM SALT BY USING IR, UV AND NMR SPECTRA

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By combining 2-amino-5-nitro pyrimidine with sodium nitrite and sulfuric acid in the presence of water, diazonium salt was created. Up to 50 degrees Celsius was maintained. To finish the diazotization, the solution was held for 15 minutes and occasionally stirred. After keeping the 8-hydroxy-4-methylcoumarin solution in 20ml of 10% sodium hydroxide solution at 0° to 50°C for an hour, diazonium salt was added. Up to pH 5 or 6, the pH remained maintained. five-(5-nitro pyrimidinylazo) eight- (1-hydroxy hexyl oxy) - By heating up 5-methylcoumarin, 4-methylcoumarin was created (5-nitro pyrimidinylazo) -8-hydroxy-4-methyl coumarin with 1-chloro-6-hydroxy hexane for 20 hours in the presence of potassium hydroxide and potassium iodide. The 5-(5-nitro pyrimidinyl azo) was treated to create the vinyl monomer. -8-(1-hydroxy hexyl oxy)-4-methyl coumarin in the solvent medium of THF with methacryloyl chloride. Lastly, the copolymer was synthesized by the treatment of vinyl monomer with MMA in presence of radical initiator AIBN in the solvent medium of DMF at 60°C for 2 days. The monomer and copolymer were characterized by IR, UV and NMR spectra.

**Keyword:**

5-(5-nitro pyrimidinylazo)-8-hydroxy-4-methyl coumarin, 5-(5-nitro pyrimidinylazo)-8-(1-hydroxy hexyloxy)-4-methyl coumarin, vinyl monomer, copolymer

**Introduction**

Due to their utility in several optical domains, aromatic azopolymers have seen increased utilization in recent years. Following the discovery of the photorefractive property of organic compounds, a number of polymers containing carazole have gained interest due to their photo-refractivity. These polymers' side chains, which have photoconductive and electro-optic capabilities, might be thought of as possible materials for photorefractive applications. Because the azobenzene group is integrated into the polymer, the azo benzene chemistry continues to create unanticipated phenomena, and in this regard, the photo isomerization events might have unexpected potential outcomes. It is widely known that the capability of constructing several variable spacers between the azo group and the main chain in polymer materials containing carbazole might boost the order degrees as well as azo group becomes much decoupled from the main chain motion.

The photorefractive polymers with carbazole ring and azomoieties in the side chain have all the necessary elements for photorefractivity properties (electro-optic chromophore and charge trappers). The azocontaining carbazole groups provided both the photoconductivity and non-linear optical (NLO) activity, and the aliphatic chain attached on the nitrogen atom of the carbazole ring acts as a spacer. Hence, the photorefractive polymer exhibit equally photoconductivity and optical non-linearity. They have concerned substantial interest due to their potential applications in optical computing, optical correlation, 3D data or image storage.

The ability of non-linear optical materials to transmit process and store information forms the basis of emerging optoelectronic and photonic technologies. Organic chromophore containing polymers, in which the refractive index can be controlled by light or an electric field, are expected to play an important role. NLO is an important component of photorefractive system. Organic moieties with delocalized pi-electrons distribution have been extensively investigated for their potential applications in optical switching and optical power limiting, each which require large and fast non-linearities for the purpose. The NLO

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DIFFERENT STATISTICAL MODELS FOR ARIMA AND SARIMA USING R-LANGUAGE:  
FEATURES EXTRACTED FROM CRYPTO CURRENCY

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### ABSTRACT

In recent years, a new kind of "asset," or intangible value as many are now considering it, known as "crypto money," has emerged. A cryptocurrency, or "crypto," as it is known in the market, is a decentralised virtual money that is managed by no central authority and mostly used for commercial and everyday activities. It is protected and highly encrypted using cryptography. This crypto opened the door for a safe transaction involving enormous sums of money. This ability to move enormous sums of money accounts for its widespread use, particularly in commercial operations. Now, due to its huge popularity and wavering price of a crypto coin sometimes spiking up of its prices due time and being able to trade or cash in the coin for more than it was bought, this advantage made people to consider it more of an investment option than as a currency. So, we want to predict the future prices of the stocks and crypto currency prices and compare them based on the risk factor in future. This paper mainly focuses on the various features of the crypto Currency using various statistical models like ARIMA(Autoregressive Integrated Moving Average) and SARIMA Models using R-Language.

**Key words:** Cryptography, Virtual Currency, Crypto Currency, ARIMA, SARIMA.

### Introduction

A ordinary person wants to advance and flourish in life, therefore while investing time, energy, and particularly money, he will exercise caution. Recently, a brand-new type of asset—or, to be more exact, a well-liked market for investments—called crypto currency has come to light. Due to its growing popularity and lucrative returns, people are now becoming increasingly interested in crypto currencies. High gains and losses go hand in hand with these high returns. Due to its enormous popularity, fluctuating price, and ability to sell or exchange a crypto currency for a higher price than when it was purchased, people are now taking it more of an investment option than as a currency. As defined above it is considered as an intangible asset, this asset is treated more as a stock, where in we buy it at a particular price and sell it at a particular price, which is pretty similar to crypto as well. The person who wants to invest his/her money has a new option in the form of crypto currency, in contrast to old stock.

### Objective of the study

The objective of the study:

- (i) To forecast the range of prices of crypto-currency taken into consideration at random for the years 2022-24, those are ADA, BNB, BTC and USDT
- (ii) To apply a chi-square test to validate the forecasted high value with stock or cryptohigh price and do the same for forecasted low value.
- (iii) To determine where to invest based on the variance.

### Research Hypothesis:

1. H<sub>0</sub>C: There will be a great difference of standard deviation between lower and upper predicted values of stocks.
2. H<sub>1</sub>C: There will be a less difference of standard deviation between lower and upper predicted values of stocks.

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REDUCTION OF WASTE AND HAZARDOUS MATERIALS BY USING GREEN CHEMISTRY

PROCESS

<sup>1</sup>Ch Mythri, <sup>2</sup>B Raju, <sup>3</sup>Uma Sundari Maruthi, <sup>4</sup>Kotturi Rohini

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**Abstract**

Green chemistry makes use of procedures that lessen waste and dangerous substances. Green is a preventative strategy that is mostly used to lessen pollution. Contrary to how pollution is cleaned up, which entails handling waste streams or cleaning up environmental spills and other discharges? Separating potentially dangerous compounds from other substances, cleaning them to make them less dangerous, or concentrating them for safe disposal are all examples of remediation. As environmental pollution from businesses and research facilities rises day by day, it is crucial to create new technologies to lessen this kind of pollution. Green chemistry is often not used in remediation processes. Remediation eliminates harmful contaminants from the environment; green chemistry, on the other hand, prevents the release of hazardous compounds into the environment in the first place.

**Keywords:** Green Chemistry, Waste Reduction, Sustainability

**Introduction**

Pollution is the process of making the environment unusable or unsafe by making the air, water, or other elements of the environment unclean. More than 200 million people are impacted by toxic pollution globally, claims pure earth, a nonprofit environmental group. In order to increase the environmental protection and the economics of chemical manufacture, novel chemistry is now absolutely necessary. Researchers and industrialists have produced a lot of vest items in recent decades as well, therefore in order to solve this issue; we must make our synthetic processes better. Green chemistry is a recently developed idea that is appealing to chemists, academics, and industrialists for cutting-edge chemical research and applications. The important work of green chemistry is characterized as reduction of the environmental damage accompanied by the production of materials and respective minimization and proper disposal of wastes generated during different chemical processes<sup>1-9</sup>. Green chemistry is a new technique devoted to the synthesis, processing, and application of chemical materials in such manner as to reduce hazards to human life and the environment<sup>10</sup>. Numerous new terms have been introduced associated with the concept of green chemistry, such as sustainable chemistry, eco-efficiency, product life cycle analysis, renewable energy sources, atom efficiency or atom economy, process intensification and integration, inherent safety, ionic liquids, and alternate feed stocks. Hence, there is an essential need to improve the synthetic chemistry either by environmental friendly starting materials or designing novel synthesis routes that reduce the use and generation of toxic substances by using modern energy sources. The term "sustainable" has been used very freely for a wide range of issues, which have had very little or nothing to do with sustainability<sup>11-12</sup>. It is proposed that this could be corrected by systematically applying two independent definitions:

*Green chemistry* is the utilization of a set of principles that reduces or eliminates the use or

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## Significance of women's marginalization, their plight, and their fight for identity in Manju Kapur novels

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### Abstract

A wide sociopolitical movement known as feminism especially promotes the welfare of women in society. Many female authors, philosophers, and critics have developed a school of thought that looks for these occurrences in literature as a result of this philosophy. Although feminist literary critique is a direct result of the women's movement in the 1960s, there were certain writers who used it earlier, in the seventeenth century. The most well-known figures among these pioneers are Virginia Woolf, Mary Wollstonecraft, and Simon de Beauvoir. Numerous feminist philosophers from all around the world, including Julia Kristeva, Helen Cixous, Luce Irigaray, Kate Millet, Elaine Showalter, Sandra Gilbert, and Susan Gubar, may be viewed in the present context. The primary objective of feminist literary critics appears to be to protect against the deterioration of patriarchal standards which have been inherited perpetually. Thus marginalization's of women, their predicament, struggle for identity, finding their own space, celebrating the female body are the chief subjects of this trend.

**Key Words:** feminist, identify, literature, patriarchy, suffering, society, welfare, women.

### Introduction

Manju Kapur's female heroines are all depicted as fighting against all difficulties. Her writing is clearly influenced by feminism. The struggle of her female characters, their fragility and fight for identification, their liberated attitude, the feminine mind, and the female biological world all clearly display this. In her debut book, *Difficult Daughters*, the protagonist feels deceived by the rigid standards of old patriarchal conventions. In *Home*, Sona resembles a caged bird. Astha must experience the pain of isolation in her heart. The pressure from her family forces Nisha to give up her independence, and she also experiences loneliness, emptiness, and sexual dissatisfaction. *Virmati* was raised in a home where she was not given a personal identity or rights to higher education. She wants to study and have career but is restricted by social conventions of the time and place. She rebels and insists on her right to higher education. Dipika Sahai (2004:09) in this connection opines: "As a rebel she is conscious of her emotional needs. Her self assertion goes to the extent of having illicit love with the married Professor whom she subsequently marries. The hardship and suffering involved in fighting against an established order, the shattering experience of rejection by her family on becoming the second wife of the professor, and the resultant alienation from society forms the theme of the novel. Her life is a continuous struggle. She wants to establish an order through defiance. She rebels against the accepted and existing moral codes and social norms." But *Virmati* asserts, feels liberated and makes no compromise in materializing her path and resolving the conflict. In connection with the theme of women's vulnerability in Manju Kapur's novels, Arpita Ghosh (2013:126) remarks: "*Virmati* fell prey to professor Harish's desire. Slowly but surely such desire swallowed up *Virmati*; she transgressed the laws of the threshold and got involved in an illicit affair with Harish both physically and mentally. He forcefully enters cottage and makes love without *Virmati*'s prior consent to the act. In spite of *Virmati*'s protest Harish beastly pounces on her and quenches his thirst for lust. Thus another violence committed in liaison, *Virmati* was doomed forever."

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Manju Kapur's female heroines are all depicted as fighting against all difficulties. Her writing is clearly influenced by feminism. The struggle of her female characters, their fragility and fight for identification, their liberated attitude, the feminine mind, and the female biological world all clearly display this. In her debut book, *Difficult Daughters*, the protagonist feels deceived by the rigid standards of old patriarchal conventions. In *Home*, Sona resembles a caged bird. Astha must experience the pain of isolation in her heart. The pressure from her family forces Nisha to give up her independence, and she also experiences loneliness, emptiness, and sexual dissatisfaction. *Virmati* was raised in a home where she was not given a personal identity or rights to higher education. She wants to study and have career but is restricted by social conventions of the time and place. She rebels and insists on her right to higher education. Dipika Sahai (2004:09) in this connection opines: "As a rebel she is conscious of her emotional needs. Her self assertion goes to the extent of having illicit love with the married Professor whom she subsequently marries. The hardship and suffering involved in fighting against an established order, the shattering experience of rejection by her family on becoming the second wife of the professor, and the resultant alienation from society forms the theme of the novel. Her life is a continuous struggle. She wants to establish an order through defiance. She rebels against the accepted and existing moral codes and social norms." But *Virmati* asserts, feels liberated and makes no compromise in materializing her path and resolving the conflict. In connection with the theme of women's vulnerability in Manju Kapur's novels, Arpita Ghosh (2013:126) remarks: "*Virmati* fell prey to professor Harish's desire. Slowly but surely such desire swallowed up *Virmati*; she transgressed the laws of the threshold and got involved in an illicit affair with Harish both physically and mentally. He forcefully enters cottage and makes love without *Virmati*'s prior consent to the act. In spite of *Virmati*'s protest Harish beastly pounces on her and quenches his thirst for lust. Thus another violence committed in liaison, *Virmati* was doomed forever."

## Significance of women's marginalization, their plight, and their fight for identity in Manju Kapur novels

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### Abstract

A wide sociopolitical movement known as feminism especially promotes the welfare of women in society. Many female authors, philosophers, and critics have developed a school of thought that looks for these occurrences in literature as a result of this philosophy. Although feminist literary critique is a direct result of the women's movement in the 1960s, there were certain writers who used it earlier, in the seventeenth century. The most well-known figures among these pioneers are Virginia Woolf, Mary Wollstonecraft, and Simon de Beauvoir. Numerous feminist philosophers from all around the world, including Julia Kristeva, Helen Cixous, Luce Irigaray, Kate Millet, Elaine Showalter, Sandra Gilbert, and Susan Gubar, may be viewed in the present context. The primary objective of feminist literary critics appears to be to protect against the deterioration of patriarchal standards which have been inherited perpetually. Thus marginalization's of women, their predicament, struggle for identity, finding their own space, celebrating the female body are the chief subjects of this trend.

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# A QUANTITATIVE ANALYSIS ON INVOLVING THE USE OF THE STEINER DISTANCE AND THE HYPER-WEINER INDEX FOR QSAR AND QSPR

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**Abstract** — For a associated graph  $G$  Randić index is given as

$$R(G) = \sum_{\{u,v\} \subseteq V(G)} \frac{1}{\sqrt{d_G(u)d_G(v)}}$$

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Let  $G$  be a simple connected graph with the properties  $|V(G)| = n$  and  $|E(G)| = m$ , which are referred to as the graph's order and size, respectively. The distance  $d(x, y) = d_G(x, y)$  is the shortest path between  $x$  and  $y$ , and the degree  $\deg_G(v)$  of a graph  $G$  is the cardinality of the first neighbours of the vertex  $u$  and  $v$ ,  $v \in V(G)$ . A extension of the historical graph distance, the Steiner distance of a connected graph was first described in 1989 by Chartrand et al. The Steiner distance  $d(S)$  of the vertices of  $S$  is the smallest size of a connected subgraph whose vertex set is  $S$  for a connected graph  $G$  of order at least 2 and  $S \subseteq V(G)$ . Li, Mao, and Gutman expanded the idea of a graph's  $G$  as the Steiner wiener index [12] denoted as wiener index in light of equation (1)

$$SW_k(G) = \sum_{\substack{S \subseteq V(G) \\ |S|=k}} d(S)$$

When  $S = \{x, y\}$ ,  $|S| = 2$ , then the stienner distance reduces to distance between a pair of vertices which is equal to the ordinary wiener index [14] that is

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Further when  $k = 0$ ,  $SW(G) = 0$ , and  $k = n - 1$ ,  $SW_k(G) = n - 1$ . Among the several hundred presently existing graph-based molecular structure descriptors [2], the Randić index of a graph was introduced by the chemist Randić under the name of "branching index" in 1975 [3] as the sum of

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### Abstract

Globally, notably in Higher Education, educational institutions have been impacted by the COVID-19 epidemic. When the physical classroom switched to an online mode on various platforms like Zoom, Webex, Google Meet, Microsoft Teams, Webinarjam, YouTube Live, etc., the teaching-learning process in student-centered classrooms bore the brunt of lockdowns. Despite certain difficulties, teachers using student-centric techniques used a variety of strategies and resources to engage students as they would in a traditional classroom. This essay describes the "Co-Teaching" technique used by the English department professors at Vivekananda Government Degree College (VGDC), Vidyanagar, and their observations of how English and soft skills are taught both online and offline. The aim of this paper is to highlight the experience of teachers while engaging in practicum the co-teaching methodology; their learning's in handling the classroom both offline and online; present the co-teaching model with core components and strategies that helped in articulating the classrooms along with its limitations. The paper concludes in reflecting upon the strategy, understanding the experiences, outcomes of co-teaching and recommendations that support the future teachers in implementing the co-teaching methodology.

**Key Words:** Co-Teaching, Team teaching, Online, Offline teaching, Soft Skills, Collaborative Teaching Learning, Online Classroom,

### Introduction

Increased enrollment and a rise in the number of students in the classroom have been the results of Degree Online Services, Telangana (DOST), and a single admission mechanism for UG admissions in GDCs of Telangana. Teachers have to manage huge classrooms while efficiently delivering instruction. They found it challenging to organize, prepare, and carry out lessons for pupils while also attending to their other academic demands. With pupils exposed to new technology that can be a huge distraction in the classroom, it was a tremendous challenge to balance teaching and upholding discipline. Co-teaching appears to be one of the options that educational institutions may employ in this situation to aid in fostering stronger relationships with students. Co-teaching or team teaching aids in instructors' responsibility division and fosters a focused learning environment, reduces stress by sharing expertise, workload and facilitates better student-teacher relationship. Students overcome inhibitions in approaching teachers to clear their doubts and seek help in comprehending the concepts imparted to them.

### What is Co-teaching?

'Co-teaching' is an educational method where two or more teachers work together and plan a classroom, make assessments on a group of students. In other words, it is the team work of two or more teachers to control the class and conduct instruction together that is practiced in institutes of higher education across the world. This technique helps teachers to bring out the best in them in terms of expertise in subject, optimum usage of teaching aids, classroom strategies and exposes the students to different styles of teaching. It enhances the overall teaching-learning process, outcomes and enables teachers to share equal responsibility and accountability to their classroom, syllabus, and curriculum related activities. It also helps the teachers to reach out to all the students and forge a stronger relationship between teacher and student.

### Some definitions of 'Co-Teaching':

Co-teaching is defined as: "When two or more professionals jointly deliver substantive instruction to a diverse or blended group of students in a single physical space" (Cook and Friend, 1995)  
 Co-Teaching is defined as "two teachers (teacher candidate and cooperating teacher) working together with groups of students; sharing the planning, organization, delivery, and assessment of



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## A research that examines the functions of elliptic flow in quark-gluon plasma

Ch Ranga Rao, Dali Sai Bhavani, L Rajitha, Dhanavath Mangla

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### Abstract

This essay provides a succinct overview of elliptic flow. The second Fourier coefficient,  $V_2$ , which measures the anisotropic momentum distributions of particles relative to the reaction plane, may be used to determine collective flows that result from pressure gradients in ultra relativistic heavy ion collisions. A brief introduction and the rationale for the computation are provided in this section. The terms required to compute elliptic flow are in the second part. The elliptic flow's physics and these years' advancements are explained in the third and fourth sections. Its measurement yields a wealth of knowledge on the early universe's expansion and quark gluon plasma (QGP).

### Introduction and Motivation

In the initial few microseconds following the big bang explosion, a new state known as quark-gluon plasma (QGP) was created at an extremely high density and temperature. The quarks and gluons are in a deconfined condition when matter is in the QGP state. Many collision studies involving heavy ions have been carried out at the Relativistic Heavy Ion Collider (RHIC) in Brookhaven National Laboratory (BNL) and the Large Hadron Collider (LHC), CERN, to discover and analyze their characteristics. The characteristics of the QGP during the collisions of heavy ions are studied using the angular correlations between the generated particles.

When two big mass nuclei contact at high energy and extreme density, a flow pattern slowly forms throughout the system's expansion<sup>1, 2, 3</sup>. Flow can be described in terms of hydrodynamics and it relates the fundamental properties of the fluid with conservation laws (mass, momentum, energy).

The relation between pressure with density and temperature builds an equation of state (EoS) for a system of nuclear matter and those EoS are important for astrophysical study like the big bang, explosions of supernovae etc. Depending upon the density and temperature, nuclear matter experiences two phase transitions

At low density and temperatures below 20 MeV, the liquid-to-vapour phase transition occurs. At high density and temperatures above 150 MeV, another phase transition of hadrons to QGP occurs. The EoS sometimes also contains the incompressibility parameter  $K$ , which calculates the resistance versus compression and affects the flow phenomena of QGP directly.

Collisions among nucleons and nuclei are described by fluid dynamics model given by Belenkij and Landau in 1955<sup>5</sup>. When a high-energy particle moving faster than the speed of sound of nucleus passes through another nucleus, shockwaves are formed and Glassgold, Heckrotte, and Watson<sup>6</sup> have studied these shockwaves propagating in the longitudinal direction in 1959 using hydrodynamics model<sup>7, 8, 9</sup>.

Depending on the size of impact parameter collisions are of two types. Those are "central" collisions having small impact parameter and "peripheral" or "non-central collision" having large impact parameter. When two nuclei collide and subsequently expand, three types of transverse flows are considered: radial transverse flow, directed flow and elliptic flow. Radial transverse flow is allowed for azimuthally isotropic central collisions and for non-central collisions, anisotropic flows i.e. directed and elliptic flow is allowed. A plane called as reaction plane, can be determined to describe those events which are not isotropic azimuthally and with respect to this plane, anisotropy of the particles are calculated for directed and elliptic flow. The azimuthal distribution of the particles with respect to this plane can be calculated from a Fourier expansion and the amplitude of the first harmonic gives the directed flow which was found out at the Bevalac<sup>10</sup>.

Elliptic flow measures the non-uniform flow of particles during the subsequent expansion of the system in the collision and this confirms the existence of QGP. The amplitude of second harmonic coefficient  $V_2$  of the Fourier expansion gives the elliptic flow. This flow restated the anisotropic space of the overlap region of the nucleus in the transverse plane to the momentum distribution of known particles. Elliptic flow is important in the early stages of system evolution as anisotropy of space is largest at the beginning of the evolution. Its measurement provides thermalization time scale as well as informations about the initial stages of a relativistic collision.

Scheid, Müller and Greiner have used ideal hydrodynamics model and shown the importance of transverse expansion for the first time<sup>8</sup>. For beam energies 12.5A MeV, the transverse flow was more than the longitudinal flow in the first 15 fm/c after penetration revealing that the products are pushed outwards in the perpendicular direction with respect to the relative motion of the two nuclei.

An interacting system attains thermal equilibrium locally after the initial collisions between two nuclei. The

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This essay provides a succinct overview of elliptic flow. The second Fourier coefficient,  $V_2$ , which measures the anisotropic momentum distributions of particles relative to the reaction plane, may be used to determine collective flows that result from pressure gradients in ultra relativistic heavy ion collisions. A brief introduction and the rationale for the computation are provided in this section. The terms required to compute elliptic flow are in the second part. The elliptic flow's physics and these years' advancements are explained in the third and fourth sections. Its measurement yields a wealth of knowledge on the early universe's expansion and quark gluon plasma (QGP).

### Introduction and Motivation

In the initial few microseconds following the big bang explosion, a new state known as quark-gluon plasma (QGP) was created at an extremely high density and temperature. The quarks and gluons are in a deconfined condition when matter is in the QGP state. Many collision studies involving heavy ions have been carried out at the Relativistic Heavy Ion Collider (RHIC) in Brookhaven National Laboratory (BNL) and the Large Hadron Collider (LHC), CERN, to discover and analyze their characteristics. The characteristics of the QGP during the collisions of heavy ions are studied using the angular correlations between the generated particles.

When two big mass nuclei contact at high energy and extreme density, a flow pattern slowly forms throughout the system's expansion<sup>1, 2, 3</sup>. Flow can be described in terms of hydrodynamics and it relates the fundamental properties of the fluid with conservation laws (mass, momentum, energy).

The relation between pressure with density and temperature builds an equation of state (EoS) for a system of nuclear matter and those EoS are important for astrophysical study like the big bang, explosions of supernovae etc. Depending upon the density and temperature, nuclear matter experiences two phase transitions

At low density and temperatures below 20 MeV, the liquid-to-vapour phase transition occurs. At high density and temperatures above 150 MeV, another phase transition of hadrons to QGP occurs. The EoS sometimes also contains the incompressibility parameter  $K$ , which calculates the resistance versus compression and affects the flow phenomena of QGP directly.

Collisions among nucleons and nuclei are described by fluid dynamics model given by Belenkij and Landau in 1955<sup>5</sup>. When a high-energy particle moving faster than the speed of sound of nucleus passes through another nucleus, shockwaves are formed and Glassgold, Heckrotte, and Watson<sup>6</sup> have studied these shockwaves propagating in the longitudinal direction in 1959 using hydrodynamics model<sup>7, 8, 9</sup>.

Depending on the size of impact parameter collisions are of two types. Those are "central" collisions having small impact parameter and "peripheral" or "non-central collision" having large impact parameter. When two nuclei collide and subsequently expand, three types of transverse flows are considered: radial transverse flow, directed flow and elliptic flow. Radial transverse flow is allowed for azimuthally isotropic central collisions and for non-central collisions, anisotropic flows i.e. directed and elliptic flow is allowed. A plane called as reaction plane, can be determined to describe those events which are not isotropic azimuthally and with respect to this plane, anisotropy of the particles are calculated for directed and elliptic flow. The azimuthal distribution of the particles with respect to this plane can be calculated from a Fourier expansion and the amplitude of the first harmonic gives the directed flow which was found out at the Bevalac<sup>10</sup>.

Elliptic flow measures the non-uniform flow of particles during the subsequent expansion of the system in the collision and this confirms the existence of QGP. The amplitude of second harmonic coefficient  $V_2$  of the Fourier expansion gives the elliptic flow. This flow restated the anisotropic space of the overlap region of the nucleus in the transverse plane to the momentum distribution of known particles. Elliptic flow is important in the early stages of system evolution as anisotropy of space is largest at the beginning of the evolution. Its measurement provides thermalization time scale as well as informations about the initial stages of a relativistic collision.

Scheid, Müller and Greiner have used ideal hydrodynamics model and shown the importance of transverse expansion for the first time<sup>8</sup>. For beam energies 12.5A MeV, the transverse flow was more than the longitudinal flow in the first 15 fm/c after penetration revealing that the products are pushed outwards in the perpendicular direction with respect to the relative motion of the two nuclei.

An interacting system attains thermal equilibrium locally after the initial collisions between two nuclei. The

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**Keywords:** pure SnO<sub>2</sub>, Sn<sub>0.94</sub>Cu<sub>0.02</sub>Zn<sub>0.04</sub>O<sub>2</sub>, nanoparticles, PXRD investigation, EDAX spectrum, FTIR measurement

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There are a few systems for the synthesis of SnO<sub>2</sub> nanoparticles, for example, spray pyrolysis [14], laser removal procedure [15], sol-gel [16], wet chemical method [17], co-precipitation [18], hydrothermal [19], strong state calcination [20]. Most importantly, co-precipitation has, for the most part, utilized as a strategy to combine SnO<sub>2</sub> nanoparticles due to its simplicity, high capability, and minimal effort.

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To make this article very captivating, we have arranged pure SnO<sub>2</sub> and (Cu and Zn) co-doped SnO<sub>2</sub> nanoparticles using the co-precipitation technique. The structural, morphological, elemental and optical qualities examined. The outcomes show that the (Cu and Zn)- co-doped particles bring a significant impact on the SnO<sub>2</sub>, which drives the material to reasonable for optoelectronic devices.

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## AN ANALYTICAL STUDY ON INFLUENCE OF VIRTUAL LEARNING ON UNDERGRADUATE STUDENTS' SOCIAL AND EMOTIONAL INTELLIGENCE SKILLS

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### Abstract

The Covid-19 epidemic swept the globe like a hurricane and had a significant impact on humanity on many fronts, including the economy, psychological and social issues, health, and education. The global education system, which has seen many changes, is one of the sectors that has been severely impacted. The epidemic has compelled higher education to switch from traditional classroom instruction to online instruction. Although forced learning is not a new concept, there are a number of issues that need to be acknowledged and resolved in the application of virtual learning. At this stage, the current study concentrated on how virtual learning affected students' cognition and their ability to acquire new skills. Additionally, studies have shown that soft skills may be efficiently acquired and enhanced in the classroom environment rather virtually (Thi Thu and Hong, 2021). In the post pandemic situation, we need to rethink about the teaching and learning process; especially in soft skills as a part of socializing and emotional intelligence skills with the virtual learning is questionable. The present paper aims to analyse the learning behaviour of the students and their opinion towards virtual learning related to socializing and developing emotional intelligence skills.

**Keywords:** Students' opinions, virtual and offline learning, social interaction and emotional intelligence skills

### 1. Introduction

The unexpected Covid-19 epidemic has altered the global landscape completely. Almost all commercial operations throughout the world have been halted by the epidemic, including those in the public sector and the education industry. Governments reacted to the outbreak with stringent lock downs and restrictions in order to save lives. And the globe soon transitioned to a virtual working and learning environment. As a result of the closure of schools, colleges, and universities, millions of students and instructors worldwide are attempting to embrace a new learning environment known as virtual learning or online learning (UN, 2020). Teachers and students spent a lot of time getting ready for virtual learning since the pandemic breakout in order to prevent becoming sick. Virtual platform such as Zoom, Micro Soft Teams, Webex, Google meet, etc is very popular for the community of teachers and students. To transfer the knowledge, virtual learning is regarded as flexible and user friendly and it is recognised as necessary transition for the beneficiaries.

Despite benefits of the virtual learning to teach and transfer knowledge to the students; there are practical problems such as difficulty in conducting online examination and assessing the performance of the students and practical assessment in laboratories found to be impractical with virtual flat forms. Moreover, a course like Soft Skills cannot be taught virtually because students need social interaction and sharing their emotional intelligence in Group Discussions, SWOC Analysis and JOHARI window. According to Vygotsky "the distance between the actual developmental level as determined by independent problem solving and the level of potential development as determined through problem-solving under adult guidance, or in collaboration with more capable peers" (Vygotsky, 1978, p. 86). It emphasizes child's knowledge and psychological development is connected with interaction in peers.

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Soft skills are gaining momentum in the 21<sup>st</sup> century than hard skills; the skills are highly required for any undergraduate and post graduate students of universities to succeed in their career (Pew Research Centre, 2017; Dellot, 2017; Chute, 2012; Ellis, Kisling, & Hackworth, 2014; Rasul, Rauf,

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## A DETAILED STUDY ON STRATEGICALLY ANALYSED INDIAN ONLINE GROCERY INDUSTRY

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### Abstract

The present pandemic has developed a sense of fear among the consumers of physically visiting the shops and stores as it leads to a greater chance of catching the deadly disease which has completely changed the way people operate in their day-to-day lives. With the increasing number of online options and the current pandemic forcing people to stay indoors has shown a paradigm shift in the use of online portals and websites to order groceries like fruits, vegetables, and other perishable & non-perishable items. While the use of online websites has increased almost two folds since the pandemic, it is worth analysing whether such a trend will continue once the pandemic is over, or not.

The present paper aims at doing a quantitative analysis based on primary data to anticipate the trends in the post-pandemic era. This paper speaks about that there are four different ways in which customer value can be created in online grocery shopping. Like the rest of e-commerce, the new format of selling groceries online has grown at a phenomenal pace and stirred up considerable hype. There seems to be no turning back, then, in the trend toward grocery e-tailing. As the Internet continues to grow, so will e-commerce. It is recognised that the grocery retail sector is unusual in that customers invariably purchase multiple items at one time, that the product mix contains multiple items that are perishable within a defined time period, that the products demanded fluctuate widely according to seasonal factor. Grocery shopping is a piece of vital undertakings that must be completed with a specific end goal to satisfy the requirements for household or not withstanding for individual consumption.

Keywords: E-grocery, Online, Consumer, Shopping, Pandemic.

### INTRODUCTION

“Online business is any kind of business activity that happens over the internet. Running an online business can include buying and selling online or providing an online service.”

The term online business may refer to the activity of buying and selling goods and services online, or specific companies. In other words, the focus might be on what a company does or what it is.

An online grocer is either a brick-and-mortar supermarket or grocery store that allows online ordering, or a standalone e-commerce service that includes grocery items. There is usually a delivery charge for this service. Brick-and-mortar supermarkets that have built internet channels to better service their clients are known as online grocers. Online grocery delivery services are available throughout Europe, Asia and North America, mostly in urban centres. The online ordering is done through e-commerce websites or mobile apps.

The COVID-19 pandemic greatly accelerated the growth of online grocers, and in the first few months of the pandemic online grocery shopping increased by 300%. In addition, first-time online grocery shoppers accounted for 41% of online grocery shoppers. The epidemic of COVID-19 has

## A DETAILED STUDY ON STRATEGICALLY ANALYSED INDIAN ONLINE GROCERY INDUSTRY

<sup>1</sup>Abhijeet Kumar, <sup>2</sup>G.Rishitha, <sup>3</sup>M.Sandeep, <sup>4</sup>D Anusha

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<sup>1</sup>S.Jayadeva Reddy, <sup>2</sup>R.Ravinder, <sup>3</sup>B.Bhoopal, <sup>4</sup>K Vamshikrishna Reddy

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In 2019-2021, the pandemic of covid-19 has changed the approach to dealing with electronic payments even in developing countries. For Instance, before the spread of covid-19, the concept of digital financial services, included system.

**Purpose:** - This study aims to find out the factors that influence customers' intention to switch from cash payment to e-payment services during COVID-19.

**Methodology:** - A descriptive literature review methodology is adopted to complete the study and to get the desired result.

**Findings:** - In this research, this study talks about how different factors like social, and technical personnel will affect customer to switch from cash payment to e-payment and how the covid-19 impact towards them

**Future:** -. However, this research still has some limitations. This study does not discuss the influence of the respondents' demographic relationship on the factors proposed in the research model. If this is taken into account in future research, the research will further increase knowledge regarding whether demographic factors are also a mediating factor influencing user migration from Cash to e-payment services.

**Keywords:** - Covid-19;E-payment; E-commerce; Perceived Risks; SwishingIntention; perceived factors.

### INTRODUCTION

Electronic payment is described as "the transfer of an electronic value of payment from a payer to a payee using an e-payment method that enables consumers to remotely access and control their bank accounts and transactions over an electronic network" (Teoh et al., 2014, p.467). There are several varieties, which are categorized according to the transaction environment and payment mechanism, like electronic cash, online credit card payment, and electronic checks, (Gholami et al., 2010). Globally, there has been a surge in demand for digital and cashless payments. The behavioural intention of users to accept mobile money and its acceptance has changed dramatically. Several prior research has been conducted in the literature to investigate various aspects that impact users' willingness to accept and utilize e-payment. E-payments provide several administrative advantages to governments, enterprises, and economies. They enable governments and financial institutions to reduce transaction costs. They improve trade at the local and international levels by facilitating e-commerce (Yokumah et al., 2017, Gholami et al., 2010; Ho and Wu, 2009). Furthermore, the e-payment system is a factor that reduces the expenses of money in circulation, resulting in significant economic advantages (Yokumah et al., 2017). However, consumers have a variety of misgivings about using online payment methods (Tella, 2012). This might explain why most e-retailers provide a variety of payment alternatives to clients, such as cash on delivery and other electronic payment instruments, such as a debit card or money transfers through e-banking. The basic uniqueness of this approach is that it does not focus on e-payment as an innovation since it does not employ traditional models of innovation adoption. Indeed, the findings suggest that characteristics other than those included in the Technology Acceptance Model (Davis, 1989) or the UTAT (Venkatesh et al., 2003) might explain perceptions of e-payment in comparison to cash payment. The cognitive variables are the advantages of e-payment, the value of e-shopping, and the congruence of e-payment with self-efficacy.

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## Exploration and Evaluation of Customer's Expectations Towards Green Marketing

<sup>1</sup>B.Sangeetha Kumari, <sup>2</sup>S.Lakshma Reddy, <sup>3</sup>P.Srikala, <sup>4</sup>A Sravanthi

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### Abstract

This research paper explains the evaluation and exploration of customers' expectations towards green marketing through data collected from different sources. Green marketing is mostly selling products that are eco-friendly and do not pollute the environment. Today people are mostly willing to buy the green marketed goods that will satisfy their moral norms. This green marketing is mostly done in different countries. This research paper's objective is to evaluate and explore what the customers are expecting from green marketing and the products sold through this medium. The methodology used in this is the secondary data collected from different sources like research papers, and articles, and by visiting different websites, and the tools used in this are the percentile analysis to understand the data. The overall results of this research paper are that the customers' expectations can be understood and also motivates the customers to purchase green-marketed products. This will be explaining about the green marketing strategy by considering a few examples.

**Keywords:** Eco-Friendly, Current trending, consumer expectation, moral norms, global wide increasing trend

### INTRODUCTION

Green marketing is the promotion of products that are thought to be eco-friendly. It incorporates product modification, changes to the assembly process, and sustainable packaging, also as modifying advertising. Yet defining green marketing isn't a simple task where several meanings intersect and contradict each other; an example of this will be the existence of varying social, environmental, and retail definitions for this term. Green, environmental, and eco-marketing are part of the new marketing approaches which do not just refocus, adjust or enhance existing marketing thinking and practice, but provide a substantially different perspective. They seek to address the lack of fit between marketing as it is currently practiced and the ecological and social realities of the wider marketing environment. The term green marketing came into wide spread use in the late 1980s and early 1990s. The Social Responsibility (CSR) report started with Ben & Jerry's this ice-cream vendor. In 1987 a document prepared by the planet Commission on Environment and Development defined sustainable development. The American Marketing Association held the primary workshop on "Ecological Marketing" in 1975. The "Green consumerism" movements within the U.S. and other countries have struggled to succeed in critical mass and influence. One of the challenges of green marketing is the lack of standards or public consensus on what constitutes "green." This lack of consensus has slowed the expansion of green products as companies are reluctant to promote their green attributes and consumers are skeptical about claims.

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## ANALYSIS ON INFLUENCE OF NITRIC ACID ON M60 SELF COMPACTING CONCRETE'S DURABILITY CHARACTERISTICS

<sup>1</sup>M.PRANAY, <sup>2</sup>A.SRINIVAS, <sup>3</sup>K.SURESH, <sup>4</sup>M.MOUNIKA GOUD

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### ABSTRACT

Innovative self-compacting concrete (SCC) can be placed and compacted without the use of vibration. Even in the midst of crowded reinforcement, it can flow under its own weight, completely filling forms and attaining full compaction. Due to its significance and capacity to address the issues with concrete mix, the properties of SCC have been the subject of numerous studies. To determine the characteristic compressive strength and split tensile strength of M60 grade concrete mix, rice husk ash (RHA) and sugarcane bagasse ash (SCBA) are used to replace cement in stepped percentages of 0%, 5%, 10%, 15%, and 20%. The concrete is then cured with normal water and nitric acid solution (HNO<sub>3</sub>) for various lengths of time (7 days, 28 days, and 60 days). Nitric acid used for the curing in the concentration of 1%, 3%, 5%. Trial mixes with the varying water cement ratio, replacement percentage, quantity of super plasticizer and viscosity modifying agent, is to be prepared and tested. This research is to investigate the degradation of self compacting concrete due to attack of nitric acid based on measurement of compressive strength loss. The test results need to be must acceptance the characteristics of self-compacting concrete such as slump flow, V-funnel, U-box and L-Box are presented.

### INTRODUCTION

High-performance self-consolidating concrete (SCC) is made to flow into formwork under its own weight. Compared to traditional Portland cement concrete, SCC is easier to pour and requires no mechanical consolidation or vibration. In 1986, self-compacting concrete (SCC), a brand-new type of high performance concrete (HPC) with exceptional deformability and segregation resistance, was created in Japan. Designing a suitable mix fraction and assessing the qualities of the resulting concrete are the main tasks involved in producing SCC. Designing a suitable mix fraction and assessing the qualities of the resulting concrete are the main tasks involved in producing SCC. RHA increases the viscosity of concrete, which boosts its ability to self-consolidate.

Concrete is the most basic element for any kind of construction work. No matter what type of building structure it is, the concrete used should be study and well compacted.

Ensuring the above points not only provide additional strength to the structure but also good finish and appearance to the final product. The compacting of any conventional concrete is done through external force using mechanical device.

The fluidity and segregation resistance of SCC ensures a high level of homogeneity, minimal concrete voids and uniform concrete strength, providing the potential for a superior level of finish and durability to the structure. SCC is often produced with low water-cement ratio providing the potential for high early strength, earlier remodeling and faster use of elements and structures. The elimination of vibrating equipment improves the environment on and near construction and precast sites where concrete is being placed, reducing the exposure of workers to noise and vibration. For SCC, it is generally necessary to use super plasticizers in order to obtain high mobility. Adding a large volume of powdered material or viscosity modifying admixture can eliminate segregation. The powdered materials that can be added are Rice husk ash (RHA), Sugarcane bagasse ash (SCBA).

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The fluidity and segregation resistance of SCC ensures a high level of homogeneity, minimal concrete voids and uniform concrete strength, providing the potential for a superior level of finish and durability to the structure. SCC is often produced with low water-cement ratio providing the potential for high early strength, earlier remodeling and faster use of elements and structures. The elimination of vibrating equipment improves the environment on and near construction and precast sites where concrete is being placed, reducing the exposure of workers to noise and vibration. For SCC, it is generally necessary to use super plasticizers in order to obtain high mobility. Adding a large volume of powdered material or viscosity modifying admixture can eliminate segregation. The powdered materials that can be added are Rice husk ash (RHA), Sugarcane bagasse ash (SCBA).

## ANALYSIS ON INFLUENCE OF NITRIC ACID ON M60 SELF COMPACTING CONCRETE'S DURABILITY CHARACTERISTICS

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### ABSTRACT

Innovative self-compacting concrete (SCC) can be placed and compacted without the use of vibration. Even in the midst of crowded reinforcement, it can flow under its own weight, completely filling forms and attaining full compaction. Due to its significance and capacity to address the issues with concrete mix, the properties of SCC have been the subject of numerous studies. To determine the characteristic compressive strength and split tensile strength of M60 grade concrete mix, rice husk ash (RHA) and sugarcane bagasse ash (SCBA) are used to replace cement in stepped percentages of 0%, 5%, 10%, 15%, and 20%. The concrete is then cured with normal water and nitric acid solution (HNO<sub>3</sub>) for various lengths of time (7 days, 28 days, and 60 days). Nitric acid used for the curing in the concentration of 1%, 3%, 5%. Trial mixes with the varying water cement ratio, replacement percentage, quantity of super plasticizer and viscosity modifying agent, is to be prepared and tested. This research is to investigate the degradation of self compacting concrete due to attack of nitric acid based on measurement of compressive strength loss. The test results need to be must acceptance the characteristics of self-compacting concrete such as slump flow, V-funnel, U-box and L-Box are presented.

### INTRODUCTION

High-performance self-consolidating concrete (SCC) is made to flow into formwork under its own weight. Compared to traditional Portland cement concrete, SCC is easier to pour and requires no mechanical consolidation or vibration. In 1986, self-compacting concrete (SCC), a brand-new type of high performance concrete (HPC) with exceptional deformability and segregation resistance, was created in Japan. Designing a suitable mix fraction and assessing the qualities of the resulting concrete are the main tasks involved in producing SCC. Designing a suitable mix fraction and assessing the qualities of the resulting concrete are the main tasks involved in producing SCC. RHA increases the viscosity of concrete, which boosts its ability to self-consolidate.

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## AN INVESTIGATIONAL STUDY ON EGG SHELL POWDER AS A FRACTIONAL SUBSTITUTION BY CEMENT IN CONCRETE

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### ABSTRACT

This study evaluated the use of egg shell powder from the egg production industry as a partial replacement for traditional cement in cement mortar. Our decisions were influenced by the egg shell powder's chemical makeup and the cement mortar's compressive strength. The egg shell powder is used as a five-hitter replacement for cement in the mortar of mix ratios 1:3, 10%, 15%, 20%, and 25% by weight of cement, respectively. Our decisions were made at the age of twenty-eight days of action by the compressive strength. On the other side of the five-hitter egg shell powder substitution, there was a noticeable loss in compressive strength. The admixtures used or saw dirt ash, ash and small silicon dioxide to reinforce the strength of the concrete combine with five-hitter egg shell powder as partial replacement for cement. During this direction, an experimental investigation of compressive strength, split enduringness, and flexural strength was undertaken to use egg shell powder and admixtures as partial replacement for cement in concrete.

**Keywords:** Egg shell powder, cement mortar, saw dirt ash, Fly ash, small silicon dioxide, compressive strength, split Tensile Strength, Flexural strength

### INTRODUCTION

Energy is essential to the development of developing nations like those in Asia. Given the limited availability of non-renewable energy resources and the need for enormous amounts of energy for Cement is a building material, hence the significance of industrial waste in general cannot be underestimated. One is what we aim for while producing one tonne of conventional cement. 1 tons of rock and other earth resources for every time one tonne of conventional cement is manufactured, an equal quantity of carbon dioxide is released into the atmosphere. The various kinds of carbon dioxide emissions function as a silent murderer in the atmosphere. In this environment, the sought-after less expensive alternative to OPC might also be necessary.

### INDUSTRIAL WASTES

Industrial waste is that the waste created by industrial activity that has any material that is rendered useless throughout a producing technique like that of factories, mills and mines. it's existed since the start of the business revolution. In recent years, special attention has been dedicated to industrial sectors that unit of measurement sources of pollution of the atmosphere. The trade produces huge volumes of solid wastes like ash, Saw dirt Ash, little oxide, which can end up in rivers, lakes and coastal waters.

The disposal of these wastes could also be an important disadvantage, which can cause risk to public health, contamination of water resources and polluting the atmosphere. AN outsized varies of food plants unit of measurement constantly accumulating substantial quantities of businesswaste.

### EGG SHELL POWDER

Eggshell consists of the many reciprocally growing layers of  $\text{CaCO}_3$ , the innermost layer-maxillary 3 layer grows on the outer egg membrane and creates the lowest thereon palisade layer constitutes the thickest an area of the covering. The best layer could also be a vertical layer lined by the organic cuticle. The covering primarily contains Ca, metal carbonate (lime) and super molecule. In many completely different countries, it is the accepted follow for covering to be dried and use as a provider of Ca in animal feeds. The quality of lime in covering waste is influenced greatly by the extent of exposure to sunlight, raw water and harsh climate. It's the fine grained powder with acceptable proportion that's sieved to the required size before use with



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## EVALUATION OF THE COMPRESSIVE AND FLEXURAL STRENGTH OF CONCRETE USING SUSTAINABLE INDUSTRIAL CERAMIC WASTE AS A PARTIAL REPLACEMENT OF CEMENT

<sup>1</sup>Dr.S.AMARESH BABU, <sup>2</sup>K. SHIVA SHANKAR, <sup>3</sup>K.SHALINI, <sup>4</sup>MD.AFROZ

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### ABSTRACT

The findings of tests testing the use of ceramic waste powder as a partial replacement for cement in concrete are presented in this publication. Environmental pollution comes from the sedimentation-based settlement and subsequent disposal of ceramic waste powder. This study was divided into two phases. In the first phase, it was examined if waste ceramic powder might replace cement in concrete. Concrete samples were created using M30 and 10–50% ground ceramic powder. Concrete mixtures were created, evaluated, and measured against traditional concrete in terms of strength. These tests were conducted to assess the mechanical qualities for a period of 7, 14, 28, and 90 days.

**Key Words:** Ceramic waste Powder, silica fume, cement concrete, compressive strength, split tensile strength and flexural strength.

### INTRODUCTION

Water, aggregate, and cement make up the bulk of the composite material known as concrete. By incorporating reinforcements and additives into the concrete mixture, the physical attributes that are needed for the completed product can be achieved. By combining these components in a specific ratio, a solid mass that can be easily shaped into desired shapes can be created. Buildings, pavements, and other structures can be made from a single hard (rigid) durable material by combining cement with the other materials over time to form a hard matrix. The Roman Empire made extensive use of the majority of the concrete technology that had been developed earlier and on a big scale by the ancient Romans. The concrete used to construct the coliseum in Rome and the dome of the pantheon is the World's largest unreinforced concrete structure. After the collapse of Roman Empire in the mid-18th century, the technology was re-pioneered as the usage of concrete has become rare. Today, the widely used man made material is concrete in terms of tonnage.

Although high strength concrete is considered as relatively a new material, its development has been gradually increasing over years. In 1950s, USA considered the concrete with a compressive strength of 34mpa as high strength. In 1960's, the concrete with compressive strength 41mpa to 52mpa was used commercially. In the early 1970's, 62mpa concrete was been made. With in the world state of affairs, however, within the last fifteen years, concrete of terribly high strength entered into the construction sector of high-rise buildings and long span bridges. The compressive strength over 110mpa has been thought-about by IS 456-2000 for the applications in pre stressed concrete members and cast-in-place buildings. However, recently reactive concrete could be the one that having a compressive strength of nearly 250mpa. It is fully supported by pozzolanic materials. The first distinction between high-strength concrete and nominal-strength concrete refers to the relation of utmost resistance offered by compressive strength of the concrete sample for the application of any type of load. Though there is no correct separation between High-strength concrete and normal-strength concrete, the Yankee Concrete Institute defined the compressive strength greater than 42mpa as high strength concrete.

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## AN ISOLATED DYNAMIC HYBRID MODEL WIND/PV/FUEL CELL POWER GENERATING SYSTEM USING SOLAR CELLS

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### ABSTRACT

This work presents the results of dynamic modelling and simulation of a hybrid power system based on renewable energy. The main topic of the study is the generation of electricity using a combination of solar cell (SC), wind turbine (WT), fuel cell (FC), and ultra-capacitor (UC) devices. An FC system and a UC bank can be integrated to ensure that the system operates under all circumstances because the output power of solar cells fluctuates with ambient temperature and radiation and the output power of wind turbines vary with wind speed. Extra wind and solar energy is converted to hydrogen in an electrolyser when it is available, and this hydrogen is then used in the fuel cell. The multiple parts of this isolated system are dynamically modelled responses of the system to step changes in the environment.

**Keywords:** Solar cell, wind turbine, fuel cell, ultra capacitor device, renewable energy resources, thermal and nuclear systems.

### 1. INTRODUCTION

Renewable energy is limitless and pollution-free in compared to nuclear and thermal energy. Natural resources such as solar energy, wind energy, hydraulic energy, and tide energy can all be used to produce electricity. Use of renewable energy is encouraged widely and widely to reduce the pollution we have generated on the globe. Wind and solar energy are welcome replacements for many other energy sources since they are renewable and limitless sources of sunlight [1]. The major drawback of wind turbines is that, because wind speeds typically fluctuate, they cause voltage and power fluctuation problems at the load side. This issue can be resolved by utilising suitable power converters and control systems.

Another major issue is storing the energy generated by wind turbines for future use when there is no wind but there is a demand [1].

The solar cell is affected by weather conditions, particularly irradiation and cell temperature. As a result, in this paper, weather variables such as irradiance and temperature are used to estimate the maximum power. Proton exchange membrane fuel cell technology has finally reached the test and demonstration phase after several technological advancements. The recent commercial availability of small PEMFC units has opened up a slew of new possibilities for developing hybrid energy systems for distant applications that use hydrogen as a type of energy storage [2].

Hydrogen conversion, which uses an electrolyzer, enables for the storage and transmission of enormous amounts of energy at much greater energy densities [2]. Furthermore, employing natural energy to combine a wind turbine, a solar cell, fuel cells, and electrolyzers is effective in reducing pollution.

A thorough dynamic model and simulation of a solar cell/wind turbine/fuel cell hybrid power system is constructed in this article, utilising a new topology to complement each other and mitigate the effects of environmental changes. To validate the efficiency of the proposed system, modelling and simulations are carried out using the MATLAB/Simulink [3] software packages.

The results reveal that the suggested hybrid power system can withstand rapid changes in natural conditions while keeping the voltage variations within an acceptable range.

### 2. SOLAR CELL (PHOTOVOLTAIC CELL)

Each photovoltaic system is built around a solar cell module. It's made up of a lot of solar cells that are all joined together. A number of solar cell models have been created, however for cell or module analysis, the single diode electrical equivalent circuit is typically utilised. A diode, a current source, a series resistance,

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Renewable energy is limitless and pollution-free in compared to nuclear and thermal energy. Natural resources such as solar energy, wind energy, hydraulic energy, and tide energy can all be used to produce electricity. Use of renewable energy is encouraged widely and widely to reduce the pollution we have generated on the globe. Wind and solar energy are welcome replacements for many other energy sources since they are renewable and limitless sources of sunlight [1]. The major drawback of wind turbines is that, because wind speeds typically fluctuate, they cause voltage and power fluctuation problems at the load side. This issue can be resolved by utilising suitable power converters and control systems.

Another major issue is storing the energy generated by wind turbines for future use when there is no wind but there is a demand [1].

The solar cell is affected by weather conditions, particularly irradiation and cell temperature. As a result, in this paper, weather variables such as irradiance and temperature are used to estimate the maximum power. Proton exchange membrane fuel cell technology has finally reached the test and demonstration phase after several technological advancements. The recent commercial availability of small PEMFC units has opened up a slew of new possibilities for developing hybrid energy systems for distant applications that use hydrogen as a type of energy storage [2].

Hydrogen conversion, which uses an electrolyzer, enables for the storage and transmission of enormous amounts of energy at much greater energy densities [2]. Furthermore, employing natural energy to combine a wind turbine, a solar cell, fuel cells, and electrolyzers is effective in reducing pollution.

A thorough dynamic model and simulation of a solar cell/wind turbine/fuel cell hybrid power system is constructed in this article, utilising a new topology to complement each other and mitigate the effects of environmental changes. To validate the efficiency of the proposed system, modelling and simulations are carried out using the MATLAB/Simulink [3] software packages.

The results reveal that the suggested hybrid power system can withstand rapid changes in natural conditions while keeping the voltage variations within an acceptable range.

### 2. SOLAR CELL (PHOTOVOLTAIC CELL)

Each photovoltaic system is built around a solar cell module. It's made up of a lot of solar cells that are all joined together. A number of solar cell models have been created, however for cell or module analysis, the single diode electrical equivalent circuit is typically utilised. A diode, a current source, a series resistance,



## CONTROLLING A WIRELESS STEPPER MOTOR BY RF TRANSMITTER AND RECEIVER DEVICE USING ARDUINO

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### Abstract

According to this study, the main objective is to employ RF communication to control a stepper motor. A radio frequency transmitter and a radio frequency receiver make up the RF (Radio Frequency) communication module. RF transmission is the foundation of the control system. Everything that has to be controlled is done through this system. A pair of RF-transmitter and RF-receiver devices operates the stepper motor. The RF module's function is to use the user's inputs to control the stepper motor. The user-input data is broadcast by the RF-transmitter component, and the data is received by the RF-receiver component. All of these parts are connected by a microcontroller unit, which is built on a PCB (printed circuit board) and that is Arduino. The success of the initiative hinges on three factors: 1) Part of the input 2) Controller component 3) Part of the output.

The RF module, which provides instructions or commands to the controller, makes up the input component. The controller part is made up of a microcontroller unit, which is constructed on a PCB called Arduino. Finally, the Output section includes a stepper motor, which allows the user to adjust the direction and speed of the motor using a set of commands.

**Keywords:** Arduino, Stepper Motor, RF receiver, RF transmitter, Communication, Frequency.

### 1. Introduction

The newest contributions to electrical motors are stepper motors. They are inexpensive and reliable since they have minimal moving parts. Despite being very small and low-power in compared to other motors, they are frequently used in automation systems since they are brushless and simple to position.

They lack a horsepower rating because they rotate in stages that are triggered by pulses sent to the stator windings rather than constantly. The motor's speed is managed by changing the pulses' frequency. Robots, telescopes, hard drives, robot antennas, and even toys all use stepper motors to provide precise positioning.

Stepper motors have a high holding torque but cannot run at high speeds. Because it translates digital pulses into set steps, a computer system can easily "step" the rotation of the motor for precise control, a stepper motor can be thought of as a "digital" counterpart of an electric motor.

A stepper motor is inexpensive, has simple drive electronics, is precise, has a reasonable holding torque, and runs at moderate speeds. A servo motor, the forerunner of the stepper motor, is required for high acceleration and large loads while maintaining accuracy.

A control system is required to control the stepper motor, and there are wired and wireless control systems available. We can't control the stepper motor over a long distance with a wired control system, and doing so takes time. Furthermore, it has a bigger number of drawbacks than benefits. Wireless communication systems, on the other hand, are frequently used. Infrared connection, Bluetooth, and other technologies are used to control stepper motors wirelessly.

The radio frequency communication system is used for longer range, uninterrupted signals, and better control.

A radio frequency (RF) transmission is a wireless electromagnetic signal that is used as a form of communication in wireless devices. Electromagnetic waves with specific radio frequencies ranging from 3 kHz to 300 GHz are known as radio waves.

Frequency refers to the rate of oscillation (of the radio waves.) RF propagation travels at the speed of light and does not rely on the utilization of a medium like air to do so. RF waves are produced by sun flares, lightning, and stars in space that release RF waves as they age. Radio waves, which have been intentionally manufactured

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UTILISATION OF PERTURB AND OBSERVING TECHNIQUE FOR IMPLEMENTATION OF BUCK-BOOST CONERTER TO EXTRACT MAXIMUM POWER FROM PV SYSYTEM

<sup>1</sup>K.Bheema, <sup>2</sup>J.Sai Kiran, <sup>3</sup>Ramavath Srinivas

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**Abstract**

Photovoltaic (PV) sources are now one of the most effective and cleanest types of renewable energy sources for producing power. It is because it is inexpensive, requires little maintenance, is environmentally friendly, etc. As a result, monitoring this energy is crucial. The output power of a PV system rises as solar radiation and cell temperature decrease. The PV module's characteristics curve (I-V & P-V) is nonlinear and only has one maximum power point (MPP) under full illumination. The MPP changes when the insulation and temperature change. The PV module's non-linear behavior makes MPPT necessary for an effective PV system. In order to run the system at MPP, a structured set of rules is necessary. These set of rules are commonly referred to as MPP tracking (MPPT) methods. There are many MPPT methods, in this project, perturb and observe MPPT method is to obtain required duty cycle to operate buck-boost converter to extract maximum power from solar PV system.

**Keywords-** Maximum power point tracking, perturb and observe method, dc-dc converters, photovoltaic system

**1. Introduction**

Modern efficient photovoltaic solar cells (PV) have emerged as a leading solution for demand-side control, renewable energy, and energy efficiency. To get the most power out of the solar PV module and convert it to the load, a maximum power point tracker is employed. The interface between the load and module is a DC-DC converter. The impedance of the load, as it is perceived by the source, is altered and matched at the source's peak power point in order to convert the greatest power.

Therefore, to keep the PV array operating at its MPP, maximum power point tracker technologies are needed. The Perturb and Observe method MPPT technique will be implemented by using Matlab tool simulink, considering the variant of circuit combination PV module and buck-boost converter with P and O MPPT.

**Solar PV Cell:**

A solar PV cell essential is a p-n semiconductor junction. When exposed to light, a current is generated. The generated current change linearly with the solar irradiance.

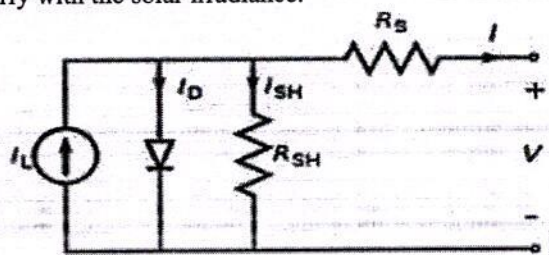


Figure 1 equivalent circuit of a solar cell

The I-V characteristics of the solar cell circuit can be sets by the following equations The current through diode is given by:

$$I_D = I_0 [\exp(q(V + I R_S) / K T) - 1]$$

While, the solar cell output current:  $I = I_L - I_D - I_{sh} = I_L - I_0 [\exp(q(V + I R_S) / K T) - 1] - (V + I R_S) / R_{sh}$

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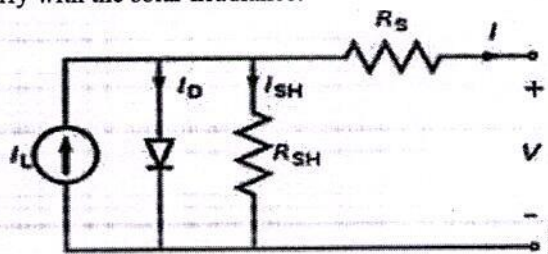


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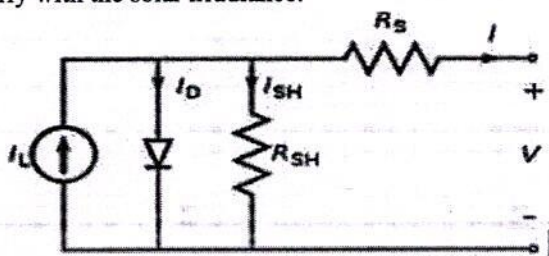


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## Grid-connected photovoltaic power plants' advanced power management and control of flexible power point tracking

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### ABSTRACT

Renewable energy sources now significantly contribute to the replacement of traditional fossil fuel energy sources. One of the most promising types of renewable energy that has grown quickly in recent years is photovoltaic energy. The main issue with photovoltaics is that as the operating parameters of the array vary, so does the voltage at which it will produce the most power. The maximum power point (MPP) of solar panels is a distinct nonlinear voltage-current characteristic that is dependent on environmental conditions like temperature and solar radiation. The solar panels must maintain their MPP despite the inescapable changes in the environment in order to constantly generate the maximum amount of power from them. Flexible power point tracking (FPPT) is the control of active power generated by grid-connected photovoltaic power plants (GCPVPPs) to provide grid-support functionality. An FPPT algorithm for the reduction of the extracted power from photovoltaic (PV) strings during voltage sags was previously proposed by the authors. An advantage of this algorithm, compared to conventional FPPT algorithms, was its fast dynamics facilitated by use of a simple PI controller that dynamically modifies the PV voltage reference. The previously proposed scheme could only be employed for the short duration in which the power system experiences a voltage sag. A novel modification to this algorithm with multi-mode operation is introduced in this letter, which provides FPPT capability for continuous operation of GCPVPPs. Unlike the previous algorithm, which was able to only move the operation point to the right-hand side of MPP, the proposed algorithm in this letter is able to move the operation point to both right and left-hand sides of the MPP that provides the flexibility to operate in the optimum operation region for both single- and two-stage GCPVPPs. MATLAB/SIMULINK simulation results are provided to demonstrate the performance of the proposed algorithm under dynamic irradiance conditions.

**Keywords:** photovoltaic's, flexible power point tracking (FPPT) algorithm, grid connected photovoltaic power plants (GCPVPPs), MATLAB/SIMULINK simulations, maximum power point (MPP).

### 1. INTRODUCTION

Grid-connected systems, where the power is fed into the electrical network, account for the majority of PV power generation. In fact, it is a booming industry in wealthy nations like Germany, which in 2010 ranked first globally in the production of PV electricity, followed by Spain, Japan, the United States, and Italy. However, PV power generation is more expensive than using other resources because of the equipment needed. Governments are encouraging it through subsidies or feed-in tariffs in the hopes that the technology will advance and soon become competitive. A crucial component is raising PV plant efficiency so that more electricity is produced. This will improve revenues and lower the cost of the power produced as a result it will approach the cost of the power produced from other sources. Renewable energy resources play an important role in electric power generation.

There are various renewable resources which is used for electric power generation, such as solar energy, wind energy, geothermal etc. Solar Energy is a good choice for electric power generation, since the solar energy is directly converted into electrical energy by solar photovoltaic modules. These modules are made up of silicon cells. When many such cells are connected in series we get a solar PV module. The current rating of the modules increases when the area of the individual cells is increased, and vice versa. When many PV modules are connected in series and parallel combinations we get a solar PV array, which is suitable for obtaining higher power output. The applications of solar energy are increasing, and many researches are done to improve the materials and methods used to harness this power source. Main factors that affect the efficiency of the collection process are solar cell efficiency, intensity of source radiation and storage techniques. The increasing installation of grid-connected photovoltaic power plants (GCPVPPs) may lead to overvoltages in the power infrastructure during peak power generation periods (e.g., noon time in a day), if the grid power capacity remains the same. In order to tackle potential challenging issues for the power system, grid codes and/or standards are continuously updated. Therefore, the existing maximum power point tracking algorithms in GCPVPPs, should be replaced by flexible power point tracking (FPPT) algorithms in GCPVPPs in order to comply with these demands. Accordingly, the algorithm will keep the operation point beyond the open-circuit voltage of the PV string. Therefore, these algorithms cannot ensure the continuous FPPT

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Renewable energy sources now significantly contribute to the replacement of traditional fossil fuel energy sources. One of the most promising types of renewable energy that has grown quickly in recent years is photovoltaic energy. The main issue with photovoltaics is that as the operating parameters of the array vary, so does the voltage at which it will produce the most power. The maximum power point (MPP) of solar panels is a distinct nonlinear voltage-current characteristic that is dependent on environmental conditions like temperature and solar radiation. The solar panels must maintain their MPP despite the inescapable changes in the environment in order to constantly generate the maximum amount of power from them. Flexible power point tracking (FPPT) is the control of active power generated by grid-connected photovoltaic power plants (GCPVPPs) to provide grid-support functionality. An FPPT algorithm for the reduction of the extracted power from photovoltaic (PV) strings during voltage sags was previously proposed by the authors. An advantage of this algorithm, compared to conventional FPPT algorithms, was its fast dynamics facilitated by use of a simple PI controller that dynamically modifies the PV voltage reference. The previously proposed scheme could only be employed for the short duration in which the power system experiences a voltage sag. A novel modification to this algorithm with multi-mode operation is introduced in this letter, which provides FPPT capability for continuous operation of GCPVPPs. Unlike the previous algorithm, which was able to only move the operation point to the right-hand side of MPP, the proposed algorithm in this letter is able to move the operation point to both right and left-hand sides of the MPP that provides the flexibility to operate in the optimum operation region for both single- and two-stage GCPVPPs. MATLAB/SIMULINK simulation results are provided to demonstrate the performance of the proposed algorithm under dynamic irradiance conditions.

**Keywords:** photovoltaic's, flexible power point tracking (FPPT) algorithm, grid connected photovoltaic power plants (GCPVPPs), MATLAB/SIMULINK simulations, maximum power point (MPP).

### 1. INTRODUCTION

Grid-connected systems, where the power is fed into the electrical network, account for the majority of PV power generation. In fact, it is a booming industry in wealthy nations like Germany, which in 2010 ranked first globally in the production of PV electricity, followed by Spain, Japan, the United States, and Italy. However, PV power generation is more expensive than using other resources because of the equipment needed. Governments are encouraging it through subsidies or feed-in tariffs in the hopes that the technology will advance and soon become competitive. A crucial component is raising PV plant efficiency so that more electricity is produced. This will improve revenues and lower the cost of the power produced as a result it will approach the cost of the power produced from other sources. Renewable energy resources play an important role in electric power generation.

There are various renewable resources which is used for electric power generation, such as solar energy, wind energy, geothermal etc. Solar Energy is a good choice for electric power generation, since the solar energy is directly converted into electrical energy by solar photovoltaic modules. These modules are made up of silicon cells. When many such cells are connected in series we get a solar PV module. The current rating of the modules increases when the area of the individual cells is increased, and vice versa. When many PV modules are connected in series and parallel combinations we get a solar PV array, which is suitable for obtaining higher power output. The applications of solar energy are increasing, and many researches are done to improve the materials and methods used to harness this power source. Main factors that affect the efficiency of the collection process are solar cell efficiency, intensity of source radiation and storage techniques. The increasing installation of grid-connected photovoltaic power plants (GCPVPPs) may lead to overvoltages in the power infrastructure during peak power generation periods (e.g., noon time in a day), if the grid power capacity remains the same. In order to tackle potential challenging issues for the power system, grid codes and/or standards are continuously updated. Therefore, the existing maximum power point tracking algorithms in GCPVPPs, should be replaced by flexible power point tracking (FPPT) algorithms in GCPVPPs in order to comply with these demands. Accordingly, the algorithm will keep the operation point beyond the open-circuit voltage of the PV string. Therefore, these algorithms cannot ensure the continuous FPPT

## UTILIZATION OF WASTE HEAT TO GENERATE USEFUL ELECTRIC CURRENT IN ELECTRIC VEHICLES

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<sup>1,2,3</sup> Assistant Professor, <sup>4</sup>UG Student, <sup>1,2,3,4</sup>Department of Mechanical Engineering, Kasireddy Narayanreddy College Of Engineering and Research, Hyderabad

### Abstract

High requirement of energy has led to over exploitation of the non – renewable energy resources. Unfortunately the efficiency of this energy is also low. In automobiles, only 1/3 of energy is utilized and 2/3 of energy is released in the form of (waste) heat. A thermoelectric generator is a device that converts some of the waste heat generated by a heat source into electricity using a phenomenon called the seebeck effect. Electric vehicles in the market are facing the issue of less range than promised by the company due to various factors. If some the waste heat generated from the vehicle can be converted back into electricity, then possibly the range can be improved. In this project a drum brake of a two wheeler moped has been used to generate heat, the goal being to measure the output voltage and try to achieve the maximum possible output from the setup.

**Keywords:** waste heat recovery, seebeck effect, drum brake, thermo electric generator

### Introduction

A thermoelectric generator (TEG), also called a Seebeck generator, is a solid state device that converts heat flux (temperature differences) directly into electrical energy through a phenomenon called the Seebeck effect [1]. Thermoelectric generators function like heat engines, but are less bulky and have no moving parts. However, thermo-electric generators are typically more expensive and less efficient. Thermoelectric generators could be used in power plants to convert waste heat into additional electrical power and in automobiles as automotive thermoelectric generators (ATGs) to increase fuel efficiency [2]. There has been a lot of research into the recovery of waste heat. One leading way is to use the technology of thermoelectric generators.

Thermoelectric generators are devices which convert heat energy into electrical energy and vice-versa. These are semiconductors works with the principle of thermoelectric effect. For waste heat utilization, these generators offer a high potential. It has been experimentally derived that the electrical power generation for thermo electric generator is a function of flow rate and inlet exhaust temperature from automotive TEGs. Also an experimental observation derived that voltage, current, power developed and efficiency of the system increases with increase in engine load[3]. The placement of TEG module in between catalytic converter and sub-muffler of the exhaust manifold is widely observed [4].

A similar automotive TEG model uses two different 'add on' parts which have different thermal properties are installed on the hot and cold junctions respectively and placed in a vacuum to enhance the current output of the TEG in an attempt to increase the efficiency of TEG module [5]. The manufacturing of thermoelectric modules is done by coupling two conjugate p-type and n-type doped semiconductor material in an optimized manner [6].

The ceramic plates are commonly made from alumina (Al<sub>2</sub>O<sub>3</sub>), but when large lateral heat transfer is required, materials with higher thermal conductivity are desired [7]. Recently developed ceramic material based generators are designed for a maximum operating temperature of 1000 °C, but in the

past, materials are made out of Bismuth Telluride and are restricted to the temperatures below 400°C.

### Seebeck Effect

The Seebeck effect is a phenomenon in which a temperature difference between two dissimilar electrical conductors or semiconductors produces a voltage difference between the two substances.

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## DRILLING PARAMETER OPTIMIZATION FOR MAXIMUM CIRCULARITY ON AISI 316 USING THE TOPSIS METHOD

<sup>1</sup>K.Baba Saheb, <sup>2</sup>N.Srikanth, <sup>3</sup>D Paramesh, <sup>4</sup>K Narashima Swamy

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### ABSTRACT

In comparison to conventional manufacturing methods, CNC machines provide a high level of precision, rapid and efficient operations, and material removal in the form of layers. CNC stands for computer numerical control. CNC is mostly employed in sectors including aerospace, manufacturing, medical, and the military that demand parts with the highest degree of precision. The major goal of the current study is to maximize the circularity attained in the drilling of AISI 316 by optimizing the drilling parameters under the given circumstances. Black oxide-coated HSS drills are used for the drilling process, and the current testing is carried out using a CNC lathe (Fanuc Controller). To prevent any mishaps while cutting components, the NC programmed is first run in the EMCO Launcher software. The matrices of test conditions consisted are cutting speed, feed rate, and depth of cut as variable parameters. This study has developed mathematical models to predict and analyzed optimized values by which AHP-TOPSIS was applied for ranking and results are validated using CMM

**Keywords:** CNC Lathe Machine (FANUC), NC Drilling Code, CMM, AHP-Topsis Method, and Black oxide HSS Drill.

### INTRODUCTION

For the highest precision and the production of complicated components, CNC machining is the manufacturing method in which material is removed from the work piece using computer controls via layer format. One of the most frequent and difficult procedures among the several machining techniques used in the industrial sector is drilling. Using multipoint cutting instruments called drills or drill bits; it is a procedure for creating round holes in solid materials or expanding existing holes. During the drilling operation, material is removed via flutes. It is extensively utilized throughout a range of industry sectors, including aerospace, automotive, electronics, equipment, and manufacturing. Optimization of machining parameters not only increases the overall capacity of machining but also the quality of the output to a great extent.

### OBJECTIVES

The objective of this research work is to optimize the drilling parameter to achieve maximum circularity on AISI 316 and analyzed optimized values by which AHP-TOPSIS was applied for ranking, and results are validated using CMM.

### LITERATURE REVIEW

Arshad Noor Siddiquee[1], the main objective of the journal is to study surface roughness under control parameters. In this journal, they have chosen four parameters like cutting fluid, speed, feed, and depth of cut to get the optimal setting for surface roughness on AISI 321 during drilling operation on a CNC lathe. FeritFicici[2], in this study, the performance of input parameters on Surface roughness in the drilling of 304 stainless steel was studied by changing the feed, speed, and depth of cut.

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## AN IMPROVED AND ENHANCED BIOMASS BURNER STOVE FABRICATION USING SOLAR POWER

<sup>1</sup>R.Surendra Rao, <sup>2</sup>M.surendar, <sup>3</sup>K.Suresh, <sup>4</sup>Panuganti Gopi

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### ABSTRACT

Cooking has always been done over open fires and with simple stoves from the beginning of recorded human history. Biomass is the fuel source for these stoves, which come in a range of shapes and sizes. Around 2 billion people continue to cook using biomass fuels.

As a more advanced biomass stove is developed, put to the test, and its performance is assessed. The stove is unique because of its portability and insulated combustion chamber. A conical flame collector with vents was further installed to facilitate the circulation of main and secondary air. The effectiveness of a stove depends on a number of factors, including the amount of heat consumed, fuel consumption, and burning rate. The efficiency of wood in stoves was tested using the University of California Berkeley (UCB)/Shell Foundation approach, which is based on ISO (International organization for standardization) norms. Compared to the conventional three-stone stove, the upgraded biomass stove had a maximum thermal efficiency of 55%, however the percentage of heat utilized (PHU) was only 44%. When cooking, the addition of a supplementary air inlet via the combustion chamber improved heat retention and boosted fire output.

**Keywords:** improved biomass stove, heat transfer efficiency, combustion chamber

### INTRODUCTION

Combustion processes, which traditionally have dominated global energy consumption, transform almost 90% of the total energy used worldwide. The primary heat- and power-supply services, including transportation, food preparation, space heating, ventilation, and air conditioning, have been the areas of concentration where the most energy has been used. The usage of biomass resources for combustion was decreased to 11% as a result of the introduction of different supplementary fuels such as coal, peat, natural gas, crude, and refined oils as combustion fuels. Small biomass cook stoves with ratings of 5 kW or less are used by billions all over the globe for a number of purposes. Because biomass fuel is a plant derivative that develops through the photosynthesis reaction and maintains the amount of carbon dioxide, unlike the combustion of fossil fuels, biomass fuel releases zero net carbon dioxide. Since the dawn of time, people have cooked using open fires and crude stoves. These stoves, which come in a variety of sizes and designs, need biomass as fuel. A third of the world's population, or close to 2 billion people, still use traditional heating and cooking methods and biomass fuels. Aside from the unavailability of newer technologies, the current approach cannot continue.





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# Fracture Analysis Of FRP Composites Subjected To Static and Dynamic Loading

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**Abstract**— Analytical solution exists for relatively simple cases. Due to complicated boundary conditions associated with the governing equations analytical approaches are used. Over the last decade or so finite element method has been firmly established as a standard procedure for the solution of practical fracture problems. The usefulness of stress intensity factors (SIF's) in the analysis of the problems of residual strength, fracture and fatigue crack growth rate has resulted in effort being expanded on the determination of SIF. A number of techniques have been suggested for the validation of SIF from the finite element results but adequate representation of crack tip singularity remains a common problem to most of these method. The objective of the present work is to investigate the Stress Intensity Factor (SIF) for benchmark problems for static and dynamic loading in composite plates having center, edge. Further the analysis is extended to CT specimen, plate with 3-point bend, v-notch and double edge notch. In the static analysis SIF's is to be found for an isotropic material using singular and j-integral approach. For the orthotropic material SIF is to be found out for the above specimens with Carbon UD/Epoxy, R Glass roving UD/epoxy, S2 glass fabric/epoxy material properties. The Transient Dynamic analysis on the above specimens is to be carried out.

**Keywords**— SIF, UD/Epoxy, V-Notch, Double edge Notch

## I. INTRODUCTION

The fundamental goal in production and application of composite materials is to achieve a performance from the composite that is not available from the separate constituents or from other materials. The need for high performance to weight ratio structure coming from the most advanced engineering fields is the main driver of the increasing usage of composite materials for crucial application.

Recent developments in industries such as aerospace industry require lightweight and stiff materials fit the bill perfectly. The materials such as fiber-reinforced plastics are widely being used as a replacement for steel in the oil and gas industry. Also the automotive industry uses laminated glass composite in the car windshields to increase their strength. Nano-aluminum is now used as a solid rocket propellant.

Ceramic composites reinforced with fibers are replacing other conventional engineering materials due to their excellent high temperature properties. Plates and shells are three-dimensional bodies characterized by the fact that one of the dimensions is much smaller than the other two [1]. Both isotropic and orthotropic materials are used for plates and steels.

Unlike conventional isotropic materials of steel and concrete. There are no readily available design charts and guidelines to help the structural engineer when it comes to working with composites. Analytical solutions for cracked plates are very limited. Aim of the present work is to provide the structural engineer with data regarding SIF and variation of stress at the crack tip using Finite Element Analysis. FEA addressing plate problem fall under two categories-one involving singularity formulations and other involving paths independent integrals approach [2].

ANSYS allows us to model orthotropic materials with specialize elements called Layered Elements. After building a model with a layered element structural analysis can be carried out. Steel and glass polymer are taken as an orthotropic materials in our present study.

## II. LITERATURE REVIEW

Ahmad and Loo [1] developed a singular element based on classical plate theory. This analysis appears flawed as mode II SIF was detected for loadings symmetric with respect to the line crack. The work of Barna A Szabo [2] studies the formulation of FEA models for beams, plates and shells, based on the principles of virtual work. The focus of implementation is to make the models suitable for numerical solutions. Ang and Williams [3] presented a closed formed solution for an orthotropic, infinite plate having finite crack within the context of the Kirchoff theory.

Sih and Chen [4] extended the same using similar concept to anisotropic plate using the Lekhnitski formalism. Yuan and Yang [5] (2000) studied the same problem by applying the Reissner plate theory and Stroh formalism.

Among the available methods for calculating fracture parameters, the interaction energy integral method Yau et al

## A general model for detecting digital image fraud using deep learning

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### ABSTRACT

Data misuse is being caused by the technological advances that are permeating every element of the modern world. Therefore, researchers must overcome the difficult process of detecting these modified data types and separating the true data from the manipulated. Splicing is one of the most popular methods for manipulating digital images; it involves copying a specific section from one image and pasting it into another. The identification of image forgeries is thought to be a trustworthy method of confirming the veracity of digital photographs. In this paper, we suggested a method based on the cutting-edge ResNet50v2 deep learning architecture. The suggested model uses the ResNet50v2 architecture and YOLO convolutional neural network weights to process image batches as input. In this study, we used the CASIA\_v1 and CASIA\_v2 benchmark datasets, which contain two distinct categories, original and forgery, to detect image splicing. We used 80% of the data for the training and the remaining 20% for testing purposes. We also performed a comparative analysis between existing approaches and our proposed system. We evaluated the performance of our technique with the CASIA\_v1 and CASIA\_v2 datasets. Since the CASIA\_v2 dataset is more comprehensive compared to the CASIA\_v1 dataset, we obtained 99.3% accuracy for the fine-tuned model using transfer learning and 81% accuracy without transfer learning with the CASIA\_v2 dataset. The results show the superiority of the proposed system.

**Keywords:** machine learning; deep learning; image forgery; ResNet50; YOLO CNN; CASIA

### INTRODUCTION

Electronic equipment is now widely and affordably available as a result of technical progress and globalization. Digital cameras have become more and more well-liked as a result. We employ the numerous camera sensors that are all around us to capture a large number of photos. Many documents that must be filed online require photographs in the form of soft copies, and a lot of images are shared on social media every day. The beautiful thing about visuals is that even those with little formal education can look at them and deduce information. Images are therefore a fundamental part of the digital world and are crucial for both storing and disseminating data. The photos can be readily edited using a variety of tools [1,2]. These tools were created with the intention of enhancing and improving the images. However, rather than enhancing the image, some people exploit their capabilities to falsify images and propagate falsehoods [3,4]. This is a significant threat, as the damage caused by faked images is not only severe, but also frequently irreversible. There are two basic types of image forgery: image splicing and copy-move, which are discussed below: Electronics 2022, 11, 403.

<https://doi.org/10.3390/electronics11030403> <https://www.mdpi.com/journal/electronics>

Electronics 2022, 11, 403 2 of 17 • Image Splicing: A portion of a donor image is copied into a source image. A sequence of donor images can likewise be used to build the final forged image. • Copy-Move: This scenario contains a single image. Within the image, a portion of the image is copied and pasted. This is frequently used to conceal other objects. The final forged image contains no components from other images. The primary purpose in both cases of image forgery is to spread misinformation by changing the original content in an image with something else [5,6]. Earlier images were an extremely credible source for the information exchange, however, due to image forgery, they are used to spread misinformation. This is affecting the trust of the public in images, as the forging of images may or may not be visible or recognizable to the naked eye. As a result, it is essential to Detect image forgeries to prevent the spread of misinformation as well as to restore public trust in images. This can be

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## CLOUD COMPUTING'S PRIVACY BASED ACCESS CONTROL SCHEMA USING ENCRYPTION TECHNIQUES

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### ABSTRACT

Cloud-based services have gained popularity as a result of the quick advancement of computer technology. They introduce several security challenges, such as data sharing and privacy concerns, in addition to offering customers convenience. In this research, we describe a privilege-based access control system for protecting privacy (PS-ACS). In the PS-ACS method, users are logically separated into the private domain (PRD) and the public domain (PUD). In PRD, we use the Key-Aggregate Encryption (KAE) and the Improved Attribute-based Signature (IABS), respectively, to accomplish read access authorization and write access permission. To get over the problems of a single point of failure and convoluted key distribution, we create a new multi-authority ciphertext policy attribute-based encryption (CP-ABE) scheme with efficient decryption in PUD to avoid the issues of single point of failure and complicated key distribution, and design an efficient attribute revocation method for it. The analysis and simulation result show that our scheme is feasible and superior to protect users' privacy in cloud-based services.

**Key words:** IABS, CP ABE, KAE, PUD, PRD.

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**AUTHORS:** S. Yu, C. Wang

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### ABSTRACT

Building on previous research, the goal of this study is to create new knowledge to better understand the most crucial aspects of e-service quality that affect customer satisfaction, customer trust, and customer behaviour. Globalization and technology advancements have led to great expansion in the electronic commerce (e-Com) industry as well as fierce rivalry. This study's goal was to test a conceptual framework based on 155 respondents' opinions of online store service quality and how it affected their satisfaction and loyalty. The study was conducted in Andhra Pradesh, India. As a result, demographic variables such as marital status, gender, customer awareness of e-mail and Internet operations, customer satisfaction, and loyalty, excluding educational background and status of residence, and e-service quality, customer satisfaction, and loyalty. It was found that there is a significant relationship between Responsiveness and trust factors were highlighted as important predictors of customer satisfaction and loyalty, with the exception of personalization. For the relationship between customer satisfaction and loyalty, all variables under satisfaction are shown to be significantly and positively associated with loyalty.

**Keywords:** customer satisfaction, online shopping study

### INTRODUCTION

Online shopping is the act of buying products or services directly from a seller while using a web browser or a mobile application. Customers can use a shopping search engine to uncover other sellers or go directly to the retailer's website to find the goods they're looking for. Shopping search engines show customers the product's availability and cost across different e-retailers. Customers will be able to conduct online transactions by 2020 utilizing a range of computers and gadgets, including desktops, laptops, tablets, and smart phones.

Purchasing goods and services online is analogous to doing so at a physical store or shopping centre. Online shopping is the practice of making a purchase from another company through an online retailer. In a typical online store, customers can view photos and images of the products, as well as browse through the firm's product line.

You can usually find specific models, brands or items in online stores by using a "search" feature. Usually customers can pay with different methods, such as a credit card debit card, or a service like UPI payments or net banking otherwise (COD) etc, is required for customers to complete a transaction online. For physical products, to the customer; In general, online retailing corporations there are many online shopping services like ( Amazon, flip-kart, meesho, etc)

### OBJECTIVES

- To know the customer satisfaction of purchases in online
- Know the specific reason or purpose of customer shopping in on line
- To understand customer satisfaction with services offered in online shopping

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- To understand customer satisfaction with services offered in online shopping

## Effective Assessment on Supplier Selection with Strategic Decision Making In Construction Organization

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**Abstract:** From the uncertainty of the setting inside a restricted time framework tends to complicate the decision-making method. This study aims to investigate the choice of the best provider that meets the mandatory criteria like product options, provider options, and delivery conditions. Increasing market pressure within the housing industry compels corporations to create fast and sensible selections conducting strategic analyses. During this regard, data spatiality could be a crucial idea that needs managers to use totally different models throughout the decision-making method not just for their own profit however additionally for the sake of all stakeholders. Analytic Hierarchy method technique is employed to gauge suppliers' characteristics that tend to incorporates various mutuality variables and complicated relationships. Provider A has comparatively higher product options and provider options. Addressing basic problems in provider choice has been progressively gaining ground within the housing industry so as to keep up a competitive advantage in respect to price and time potency in addition as property. Corporations operate in an exceedingly setting wherever selections square measure got to be handled in a rather holistic manner. Once managers square measure close to build strong selections, they're ultimately duty-bound to feel accountable to each the corporate and varied teams of stakeholders. Overall, decision-making is of important importance for company each in an exceedingly macro perspective thanks to existing ecological considerations and additionally in an exceedingly small perspective in terms of property.

**Keywords:** Analytic Hierarchy Process, strategy, decision-making, supplier selection, construction industry.

**Introduction:** The research conducted in this study aims to explore and subsequently overcome problems and deficiencies that are associated with the multi-criteria nature of the corporate environment. A number of methods can be used in order to evaluate multiple variables.

## INFLUENCE OF AL7075-BERYL-GRAPHENE HYBRID MMCS HARDNESS AND DURABILITY ATTITUDES ALTERED BY MULTI DIRECTIONAL FORGING

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### ABSTRACT

The current work examines the microstructure, hardness, and wears behaviour of hybrid nano metal matrix composites that contain Al7075 as the matrix material and Beryl and Graphene Nano Platelets (GNPs) as reinforcing components. The weight percentage (wt%) of beryl is 6wt%, whereas the weight percentages of GNPs range from 1wt% to 2wt%. The liquid metallurgical procedure stir casting, which is the most practical and popular, was employed to make the hybrid nano composites. The purpose of this study was to combine heat treatment with multidirectional forging (MDF), a method of extreme plastic deformation. In this study, the impacts of several heat treatments, such as annealing, solid solution, peak ageing, and over ageing before MDF, on mechanical characteristics were examined. The heat-treated material is processed with the multi-directional forging (MDF) technique procedure at 200°C. A scanning electron microscope (SEM) is used to study the effect of adding Graphene and Beryl reinforcement material in Al 7075 alloy, and a Vickers hardness test is performed to examine the hardness of developed as-cast and MDF processed composites. The Pin-On Disc test is used to study the wear behavior of the as-cast and MDF processed Composites. The SEM results reveals the uniform distribution of the reinforcement in Al7075 alloy. Increased hardness is noticed post incorporation of Graphene and Beryl reinforcement as compared to Al7075 alloy.

**Keywords:** Al7075 Alloy, Beryl, Graphene, Severe plastic deformation, Microstructure

### INTRODUCTION

Aluminum alloys are also visually appealing metallic materials for a number of applications due to the unique characteristic combinations they provide. The present generation's rising technologies and trends mandate the integration of numerous features and the shrinking of cumbersome structures to light weight structures in order to fulfill application needs [1,5]. Aluminum alloys are employed in structural applications more frequently than steel, which is the primary metal. The Al7075 alloy is used in a number of stressed structural applications, including those for airplanes. Aluminum-based Metal Matrix Composites (MMCs) are employed in many automotive applications because they have a variety of improved customizable properties. Numerous researchers have been inspired to investigate novel materials and cutting-edge methods of their preparation by the need to enhance the mechanical properties of aluminum alloys. In order to meet the needs of various engineering applications, research primarily focuses on identifying reinforcing materials with superior mechanical properties. The type of reinforcements employed affects the aluminum matrix's performance. Several reinforcements, including SiC, C, B4C, Al2O3, Al3Ni, ZrO2, W, and TiC, have been utilized by researchers to improve the functionality and characteristics of AMMCs. It has been discovered that beryl and graphene nanoplatelets (GNPs) are the best reinforcing materials for enhancing the characteristics of aluminium MMCs. Al alloy can be strengthened primarily through alloying and age-hardening [5-6]. New complementary and alternative approaches, based on straining and grain refinement, are nonetheless presented. As a result, over the past 20 years, several efforts have been made to develop ultrafine grained (UFG) materials. The Hybrid Metal Matrix is a significant advancement in the development of advanced materials. Aluminium and its alloys are the most

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ANALYSIS ON BEHAVIOR OF CUMULATIVE WEIGHT GROWTH FOR HVOF LOW  
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The operating circumstances of power plant boilers are favorable for fire side corrosion in the regions of the super heater, reheated, and furnace wall, which has the effect of weakening the tube wall and causing early failure. As a result of combustion products changing their state of matter and turning into salts at high temperatures, corrosion can happen in a number of ways in coal-fired boilers. Chromium and molybdenum are the main alloy additions utilized in the fabrication of the low alloy carbon steels used in the boiler tube. Chromium does provide oxidation resistance by creating a passive oxide layer on the surface of the alloy, but the quantity in the boiler tube is insufficient to produce a protective exterior scale. Present materials being capable of resisting oxidation environments are highly alloyed and thus expensive. In search for cost effective solution for oxidation, various coating like thermal sprayed coatings have become more attractive. The high velocity oxy- fuel (HVOF) process belongs to the family of thermal spray process and as grown into a well-accepted industrial technology. This process has been shown to produce coating with better density, coating cohesive and bond strength than other thermal spray process.

HVOF spraying has been carried out using HIPOJET 2700 equipment, using super charging jet generated by combustion of liquid petroleum gas and oxygen mixture. The feed stock powder namely CoCrAlYTaNi-Cr<sub>3</sub>C<sub>2</sub> has been HVOF sprayed on boiler tube steels. The microstructure, physical and mechanical properties of coatings has been studied and characterized. Further, behaviour of the coated materials at high temperature is significant. Thermocyclic oxidation studies in the oxidation environment at 700°C for 50 cycles are carried out. It is seen from the results that the cumulative weight gain for the HVOF coated steel is significantly lower than that of uncoated steel subjected to oxidation.

**Keywords:** online shopping, convenience, web site quality, awareness

**INTRODUCTION**

The demands of today's industry cannot be met by a single material, thus a composite system using a base material that provides the required mechanical strength is used instead. Corrosion is the term used to describe the deterioration of metals caused by a chemical reaction in the presence of the immediate environment.

When surfaces covered with a thin coating of few environments are subjected to high temperature circumstances, oxidation is the rapid oxidation that results. Common examples of this type of oxidation are gas turbines, boilers, internal combustion engines, etc. Coating materials have been created to reduce this oxidation, and other coating methods have also been researched. In this work, an effort has been made to examine the mechanical, physical, and micro structural characteristics of the high velocity oxy fuel sprayed on boiler tube steels.

**Review of Literature**

The total economic loss from all types of corrosion in India is approximately \$6500 USD [1]. Hot corrosion, which occurs as a result of elevated temperatures, results in rapid oxidation. It is caused by the formation [2]. The sulphur content of the gases reacting with the metal's surface caused fire side corrosion. The coal also contains vanadium, which when burned produces V<sub>2</sub>O<sub>5</sub>. This reacts again with sodium sulfate to generate vanadates, which are very corrosive at high temperatures [3]. The presence of sulphur in low-quality coal causes SO<sub>2</sub> to be produced during combustion, which then oxidizes to produce sulfur trioxide, which reacts

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## Assessment of the tensile characteristics of 3D printed PLA specimens wrapped in carbon fibre fabric

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### ABSTRACT

The purpose of this work is to assess the mechanical reaction of Polylactic Acid (PLA) pieces produced using fused deposition modelling and wrapped in carbon fibre fabric using resin. Layers of materials are fused together in a pattern during the additive manufacturing process known as FDM 3D Printing to form an item. In order to build an item layer by layer, the PLA material is typically heated slightly above its glass transition temperature and then extruded in a pattern adjacent to or on top of prior extrusions. For tensile and wear tests, ASTM specimens with precise dimensions are 3D printed using PLA and wrapped in carbon fibre fabric using resin. The results are then evaluated by comparing the mechanical properties of the specimen wrapped with carbon fiber mat and without the wrapping of carbon fiber mat. Finally, we are determining the percentage improvement in the strength and mechanical properties compared to the traditional material.

**Keywords:** FDM 3D Printing; Polylactic acid (PLA); Carbon fiber; mechanical properties.

### INTRODUCTION

A modeling technique known as fused deposition modeling belongs to the 3D printing technology's material extrusion subcategory. Three-dimensional items are produced using FDM printers using filament made of a thermoplastic polymer. In FDM printers, the filament is forced into a heated extruder. In order to create the finished thing, the filament is heated first and then deposited through the nozzle onto a created platform. Layers of materials are fused together in a pattern during the additive manufacturing process known as "Fused Deposition Modeling," or FDM 3D Printing, to produce an item. In order to create an object layer by layer, the material is typically heated slightly above its glass transition temperature and then extruded in a pattern adjacent to or on top of earlier extrusions. One of the biggest advantages of FDM 3D printing is scalability- It can be easily scaled to any size. This is because the only constraint in the size of a build area is the movement of each gantry- make the gantry rails longer and the build area can be made larger, but no other printer design is capable of being scaled as easily with as few issues as FDM. One of the more obvious benefits of having an easily-scalable design is the cost-to-size ratio. FDM printers are continually being made bigger and less expensive, due to low part costs and the simple designs involved. Another advantage is material flexibility. On any FDM printer, a wide variety of thermoplastic materials and exotic filaments can be printed with relatively few upgrades and modifications, something that cannot be said of other styles where a material must be a resin or fine powder.

Polylactic Acid, commonly known as PLA, is one of the most popular materials used in 3D printing. It is the default filament of choice for most extrusion-based 3D printers because it can be printed at a low temperature and does not require a heated bed. PLA is hard, strong and biodegradable but is brittle, being based on plant starch rather than crude oil. PLA delivers aesthetics and strength over toughness. When it comes to the features of PLA, it is naturally transparent and can be colored to various degrees of translucency and opacity. It is strong and more rigid than other materials used in 3D printing. It comprises of less warping and shrinking issues unlike other materials which makes it ideal for small parts. Printed objects usually have a glossier look and feel to them, and as a result it cannot stand too much heat, as standard PLA becomes soft around 50°C. However, one may consider this as an advantage in order to easily repair, bend or weld printed parts. There are many applications for PLA materials as follows; PLA is used in food packaging, bags, disposable tableware,

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### INTRODUCTION

A modeling technique known as fused deposition modeling belongs to the 3D printing technology's material extrusion subcategory. Three-dimensional items are produced using FDM printers using filament made of a thermoplastic polymer. In FDM printers, the filament is forced into a heated extruder. In order to create the finished thing, the filament is heated first and then deposited through the nozzle onto a created platform. Layers of materials are fused together in a pattern during the additive manufacturing process known as "Fused Deposition Modeling," or FDM 3D Printing, to produce an item. In order to create an object layer by layer, the material is typically heated slightly above its glass transition temperature and then extruded in a pattern adjacent to or on top of earlier extrusions. One of the biggest advantages of FDM 3D printing is scalability- It can be easily scaled to any size. This is because the only constraint in the size of a build area is the movement of each gantry- make the gantry rails longer and the build area can be made larger, but no other printer design is capable of being scaled as easily with as few issues as FDM. One of the more obvious benefits of having an easily-scalable design is the cost-to-size ratio. FDM printers are continually being made bigger and less expensive, due to low part costs and the simple designs involved. Another advantage is material flexibility. On any FDM printer, a wide variety of thermoplastic materials and exotic filaments can be printed with relatively few upgrades and modifications, something that cannot be said of other styles where a material must be a resin or fine powder.

Polylactic Acid, commonly known as PLA, is one of the most popular materials used in 3D printing. It is the default filament of choice for most extrusion-based 3D printers because it can be printed at a low temperature and does not require a heated bed. PLA is hard, strong and biodegradable but is brittle, being based on plant starch rather than crude oil. PLA delivers aesthetics and strength over toughness. When it comes to the features of PLA, it is naturally transparent and can be colored to various degrees of translucency and opacity. It is strong and more rigid than other materials used in 3D printing. It comprises of less warping and shrinking issues unlike other materials which makes it ideal for small parts. Printed objects usually have a glossier look and feel to them, and as a result it cannot stand too much heat, as standard PLA becomes soft around 50°C. However, one may consider this as an advantage in order to easily repair, bend or weld printed parts. There are many applications for PLA materials as follows; PLA is used in food packaging, bags, disposable tableware,

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### Abstract

Demand for lightweight vehicles along with attractive and complicated geometric shapes is growing day to day in a rapid way. By reducing the weight of the vehicles, the fuel consumption and emissions are considerably reduced as well. For weight, cost reduction and for better utilization of scrap remained after some sheet metal operations, the Tailor Welded Blanks (TWBs) is a promising technology. TWBs best suited for both automotive and aerospace applications. In producing of TWBs, a structural part or product is made by joining two or more metal sheets of possibly different thicknesses, materials, and surface coatings. This paper deals with mechanics of TWBs. The paper is divided into three major topics. The first topic deals with mechanical properties of TWBs in which Tensile testing, tensile properties and hardness of TWBs are discussed. The second topic deals with the formability of TWBs which covers the formability testing methods, effect of different parameters on the formability of TWBs, material flow phenomena, control of material flow, stress and strain distributions are covered. The third topic is mostly focused on failure and fracture of TWBs in which Modes of Failure is discussed.

**KEYWORDS**— Tailor welded Blank, Mechanical Properties, Formability and Failure Modes.

### I. Introduction

TWBs are formed by joining two or more metal sheets together, of possibly different thicknesses of different materials, and are of coated with different surface coatings. The point to be noted is that the welding is done prior to the forming it into the desired shape. The possibility of having dissimilar sheets of different thickness, strength, and material properties enable the designer to distribute the material optimally [1]. Optimal distribution of the material means creating lighter structures, higher strengths, and joining before forming results in lower production costs[1-2]. Among welding methods, Laser Beam Welding (LBW) and Mash Seam Welding (MSW) have received much more attention [1-2]. Due to some reports, either CO<sub>2</sub> or Nd: YAG laser welding is used in approximately 99% of all TWB application [3]. However, other types of welding such as Friction Stir Welding (FSW), electron-beam welding, and induction welding can also be used for this purpose [2-3]. Friction stir welding (FSW) is also become an important joining technology for the automotive industry. In fact, FSW process is probably the solution to overcome some of the usual problems which are associated with the fusion welding of aluminium alloys, but is also an important step in now a days environmental concern by the possibility of reducing

## END TO END GENERATIVE TEXT SPEECH SYNTHESIS MODEL USING TACOTRON

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### ABSTRACT

For humans, speech is the most significant form of communication. Synthesized speech provides a means of communication for those who are unable to grasp sign language. In other words, this end-to-end speech synthesis is a synthetic rendition of human voices. Consequently, in this research, we introduce tacotron, an end-to-end generative text-to-speech model that creates voice directly from the input characters. We used the sequence to sequence model to solve this problem. Tacotron receives a 3.820.085 mean subjective rating on the 5-scale in US English.

**Key Words:** Speech Synthesis , End-to-endModel , Text to Speech.

### 1. INTRODUCTION

Now-a-days The pipelining method for text-to-speech is more difficult. Vocal feature prediction is challenging since it frequently needs to extract several linguistic features from the input text and take into account the length of the phonemes. This will result in an increase in the amount of errors in various operations. A single model is presented as a solution, which is more advantageous than a multistage model. Therefore, we may train on rich, expressive, but slightly noisy data using our end-to-end model.

In essence, our TTS model decompresses the extremely compressed text or data into audio format. Speech is produced by Tacotron at the frame level. Additionally, it is primarily based on the attention paradigm and the sequence-to-sequence model. This model creates by using the characters as input and produces the corresponding spectrograms.

TTS consist of a number of stages which are designed independently for eg: text normalisation, linguistic normalisation, Mel-spectrogram synthesis and raw audio waveform synthesis. It contains two components they are acoustic model and a vocoder. Acoustic model predicts acoustic features from texts and vocoder synthesizes speeches with generated acoustic features. End-to-end TTS system have Encoder-Decoder structure with attention mechanism which is used for alignment learning. Tacotron uses autoregressive attention. It predicts the duration of each input token and produces an audio- aligned representation as the output.

### 2. BLOCK DIAGRAM

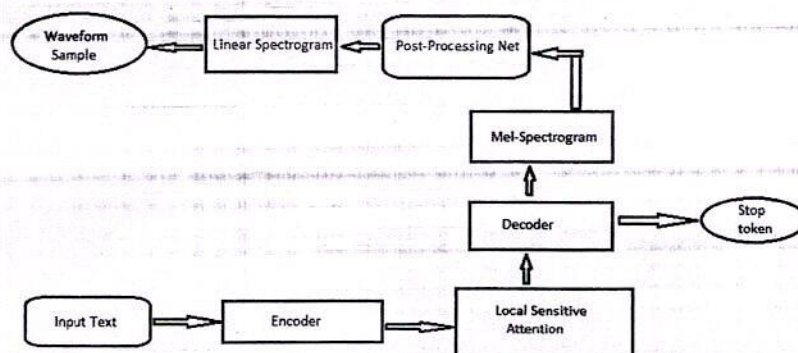


Fig. 1: Block diagram of Tacotron based end-to-end TTS model



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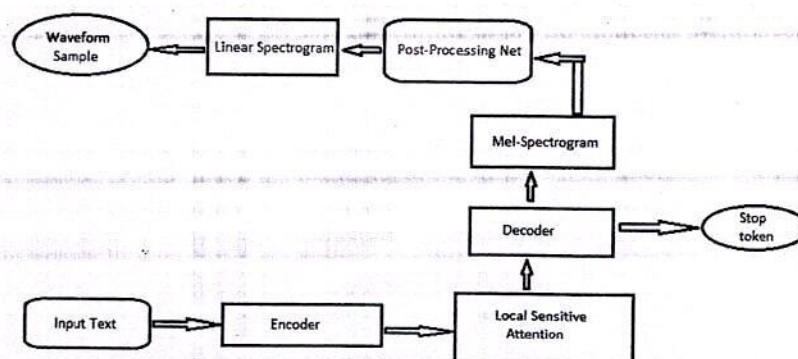


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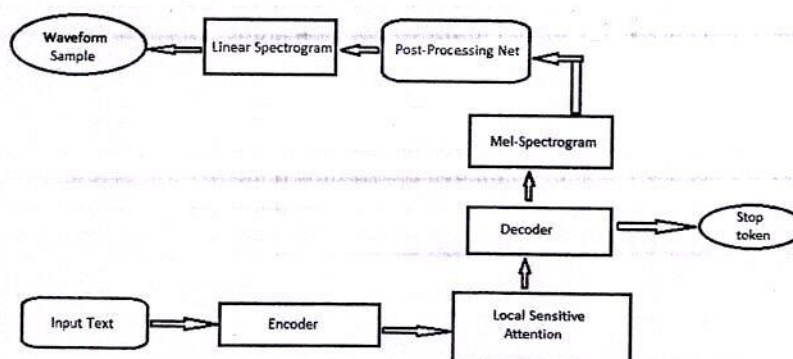


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## ANALYSIS ON A MULTI-BAND ANTENNA FRACTAL SHAPE EXAMINATION ON DGS

<sup>1</sup>B.Mani Kumar, <sup>2</sup>L.Ravi Chandar, <sup>3</sup>K.Harinatha Reddy

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### ABSTRACT

In order to create a new type of multi-band antenna with improved performance in a lightweight architecture, fractal forms and defective ground structure (DGS) were combined. This design is ideal for geostationary satellite communications. As a unique fractal form etched into the antenna's ground plane, Apollonius circles are employed to tune in various frequency bands. To create a 2x2 array antenna architecture, one antenna is constructed. The test results showed the effectiveness of this incredibly compact antenna design, which were achieved using the HFSS (High frequency structure simulator) programmed.

**Index terms**– Fractal, DGS, Apollonius circle, Array Antenna, HFSS

### 1. INTRODUCTION

The primary goal of the portable and simple-to-install lightweight and effective antenna architecture is to fit in Geostationary Satellite Communications System. This broad variety of requirements can be satisfied by designing an antenna that combines fractal shapes, DGS, and the array structure.

Benoit Almond Bread was the first to describe fractal structure. In 1986, Y. Kim and D.L. Jagard conducted the first fractal research. Because of its self-similarity, fractal structures aid in optimizing antenna designs and performance.

In order to enhance the cut-off frequency characteristics of the circuit, DGS systems have been researched in the literature. The rejected bands were defined using the designed ground structures. Additionally, DGS should ideally lessen the impact of cross-polarization on micro strip patches.

Array Antenna researches were being done extensively based on the spacing between single antennas which are used because that space is related to gain and the return loss parameters.

In this article, the concepts of fractals, DGS and arrays has been utilized to provide an effective and multi-functional antenna on a small size ground structure. Etched fractals on DGS are obtained by iterating three Apollonius circles with their reference triangles in a nested structure that can work at three different bands. A 2x2 array antenna architecture is designed using HFSS (High frequency structure simulator) software. The finally designed antenna has the dimensions of 18.464mm x 18.464mm which is proven as smaller antenna and outperforming. Fractal shape, Apollonius shaped fractal on DGS will be discussed first and then the array antenna design will be explained with its obtained parameters.

### 2. FRACTAL SHAPE

There are many types of fractals in antenna systems. Different fractal shapes were taken from the nature as source of inspiration. The most famous types are Koch, Sierpinski, Minkowski and Hilbert, which are several antenna models. Koch type fractal antennas are first studied by Cohen which improves efficiency in dipole antennas. Research on fractal forms progresses with antenna structure depending on their frequency and radiation pattern of fractal arrays. Fractal shape provides the necessary continuity to extend the shape through the connection. Fractals have different dimensions irrespective of their shapes. The dimension of the fractal structure can be calculated as follows:

$$= \frac{\log(N)}{\log(r)}, l = h\left(\frac{N}{r}\right)^n$$

where 'D' is the dimension, 'l' is the length, and 'N' is the number of parts shape, 'r' is the number of splits per iteration, 'h' is height, 'n' is the number of iterations.

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## RFID AND IOT-BASED SMART SHOPPING CART SYSTEM USING ZIGBEE TECHNOLOGY

<sup>1</sup>M.Varasundar, <sup>2</sup>M.Nikhil Sitharam, <sup>3</sup>P.Seetaramaiah

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### ABSTRACT

On weekends, holidays, and during sales events, there is a sizable crowd at supermarkets and shopping centres nowadays. People make a variety of purchases and load them into a cart. He or she must go to the billing counter for invoicing and payment after making their entire buy. At the moment, only the billing counters in supermarkets use barcode scanners to process payments. Customers occasionally complain about insufficient product information and wasted time at the cash registers. An RFID-based smart shopping system is suggested as a solution to this problem. Each product in this system has an integrated RFID tag. When a product is added to the cart, the cart's integrated technology with the help of RFID reader immediately reads the product information and after this, each product information is showed Mobile application. Hence, billing is made from the mobile itself preventing customers from waiting in a long queue at checkout.

**Keywords:** Arduino UNO, RFID Reader Module, RFID Cards, Buzzer, Mobile Application.

### 1. INTRODUCTION

Customers go to supermarkets to get the items they need on a daily basis and pay for them. After finishing their shopping, customers must wait in line at the billing terminals until the merchandise is billed, creating lengthy lines. The barcode approach is currently used in malls. Each product in this system has a barcode label that can be read by a barcode reader that has been specifically created for the purpose. Long lines are a result of the time-consuming barcode method.

The emergence of new technology like radio frequency identification devices (RFID) and wireless networks has sped up, made transparent, and improved old retail operations. RFID plays an integral role in the applications of IoT. Data is distributed and received with a system consisting of RFID tags, an antenna, an RFID reader, and a transceiver. They are heavily used to track items in production environments and to label items in supermarkets. They are usually thought of as an advanced barcode.

### 2. LITERATURE SURVEY

In the paper entitled "electronic shopping using barcode scanner", consists of barcode scanner for product identification and an LCD display that informs consumer about product details, when the customer is done with shopping, he can just press the End shopping button and the details are sent to the server [1]. M. A. Lambay [2] developed "Automated Billing Cart", this model has a cart which consists of a barcode scanner by which customer can scan the product and automatically the product details stored in the database will be displayed on android application. The barcode scanner system is a slow process. The efficiency of RFID is better than the barcode system [3], when the electronic tags come in range of reader it reads the stored data wirelessly which is known as RFID technology [4], A. Wani [5] proposed "RFID based intelligent trolley system using Zigbee", this system uses RFID technology when the consumer put any product in trolley tag will be detected as the products are added costs will be added to total bill and data will be transferred to computer via zigbee module.

### 3. PROPOSED METHODOLOGY

In this system we have a shopping trolley which is integrated with a RFID reader, Arduino uno, Bluetooth module and products are tagged with RFID tags. When the customer drops an item into the trolley the item is

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The emergence of new technology like radio frequency identification devices (RFID) and wireless networks has sped up, made transparent, and improved old retail operations. RFID plays an integral role in the applications of IoT. Data is distributed and received with a system consisting of RFID tags, an antenna, an RFID reader, and a transceiver. They are heavily used to track items in production environments and to label items in supermarkets. They are usually thought of as an advanced barcode.

### 2. LITERATURE SURVEY

In the paper entitled "electronic shopping using barcode scanner", consists of barcode scanner for product identification and an LCD display that informs consumer about product details, when the customer is done with shopping, he can just press the End shopping button and the details are sent to the server [1]. M. A. Lambay [2] developed "Automated Billing Cart", this model has a cart which consists of a barcode scanner by which customer can scan the product and automatically the product details stored in the database will be displayed on android application. The barcode scanner system is a slow process. The efficiency of RFID is better than the barcode system [3], when the electronic tags come in range of reader it reads the stored data wirelessly which is known as RFID technology [4], A. Wani [5] proposed "RFID based intelligent trolley system using Zigbee", this system uses RFID technology when the consumer put any product in trolley tag will be detected as the products are added costs will be added to total bill and data will be transferred to computer via zigbee module.

### 3. PROPOSED METHODOLOGY

In this system we have a shopping trolley which is integrated with a RFID reader, Arduino uno, Bluetooth module and products are tagged with RFID tags. When the customer drops an item into the trolley the item is



## Different Motion Vehicleic Car Control Using Arm Based on IOT to Produce Cloud Service



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### Abstract:

The world of control is an exciting field that has exploded with new technologies where the Internet of Things (IoT) vision becomes reality. This paper proposes a multiple motion controlling mechanism of a vehicleic car using ARM controller which works as master of the project. Each device is uniquely identifiable by the controlling software which is the core concept of IoT. Client manages the activities of the car from remote or distant places over the internet by voice commands and Universal Windows Application and also able to get data and feedback. The main contribution of this paper is that it leverages the efficiency of vehicle motion controlling system because vehclie car can receive direct commands at a time from multiple sources which make the maneuvering system more efficient. Both device and client do not need to be online at the same time. Commands and data are stored in cloud service which delivers them when the device is ready to receive. A GPS system is incorporated thus clients can trace the car. The system has ultrasonic distance sensor for avoiding obstacles coming in between its path. And illustrate how to control the car by means of commands and application. This task is planned utilizing a Microcontroller which frames the control unit of the undertaking. As indicated by this task, an android is utilized to transmit the information to vehicle and vehicle is getting the information and controls the bearing of the vehicle.

Similarly, Bluetooth which is set on the vehicle gets the summons as per which the course of the vehicle is changed. The microcontroller is controlling the course as indicated by summons being gotten at the Receiver side i.e... Vehicle segment.

### Segments:

ARM Microcontroller, Android, Bluetooth, GPS, GPRS, LCD-Display, Ultrasonic Sensor, Battery, Motor Driver, Motors, Kiel U vision, Embedded 'C', Express PCB, Android.

### Existing System:

This project describes the design of a simple, low-cost microcontroller Increasing commercial use of the Global Positioning System will soon make it possible to locate anything, anywhere, anytime. The Global Positioning System can provide extremely accurate location information for mobile objects and people which is far superior to earlier tracking techniques. The challenge today is integrating the necessary components into older systems and improving GPS accuracy in areas with numerous obstructions. As more devices become GPS enabled, accuracy will increase and the system's scale and global reach will benefit everyone.

### Drawback:

This paper has some limitations. No video surveillance system has been incorporated.

# Deep Learning And Multiclass SVM Algorithms For Finding And Identifying A Missing Child

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## ABSTRACT

In this project, members of the public can post pictures of children that appear suspicious along with notes and landmarks. The image will be automatically compared to the repository's registered images of the missing child. The input child image is categorized, and the missing children database will be searched for the photo that matches the input child image the best. In order to do this, a deep learning model is trained to accurately identify the missing child using the facial image uploaded by the public and the missing child image database that is provided. Here, face identification is accomplished using the Convolution Neural Network (CNN), a very successful deep learning technology for image-based applications. With the aid of a trained CNN model, face descriptors are derived from the photos. Face deep architecture for VGG. Compared with normal deep learning applications, our algorithm uses convolution network only as a high level feature extractor and the child recognition is done by the trained SVM classifier. Choosing the best performing CNN model for face recognition, VGG-Face and proper training of it results in a deep learning model invariant to noise, illumination, contrast, occlusion, image pose and age of the child and it outperforms earlier methods in face recognition based missing child identification.

## INTRODUCTION

Any nation's future is dependent on how well its children are raised. India is the second most populated nation in the world, and a sizable portion of its population is made up of children. But sadly, a significant number of kids go missing every year in India for a variety of causes, such as kidnapping or abduction, runaways, trafficking kids, and lost kids. The fact that, despite an average of 174 children going missing every day in India, half of them are still unaccounted for is incredibly troubling. Children who disappear may be used and mistreated in a variety of ways. The Ministry of Home Affairs (MHA) highlighted the National Crime Records Bureau (NCRB) report in the Parliament (LS Q no. 3928, 20-03-2018), more than one lakh children (1,11,569 in actual numbers) were reported to have gone missing till 2016, and 55,625 of them remained untraced till the end of the year. Many NGOs claim that estimates of missing children are much higher than reported. Mostly missing child cases are reported to the police. The child missing from one region may be found in another region or another state, for various reasons. So even if a child is found, it is difficult to identify him/her from the reported missing cases. A framework and methodology for developing an assistive tool for tracing missing child is described in this paper. An idea for maintaining a virtual space is proposed, such that the recent photographs of children given by parents at the time of reporting missing cases is saved in a repository. The public is given provision to voluntarily take photographs of children in suspected situations and uploaded in that portal. Automatic searching of this photo among the missing child case images will be provided in the application. This supports the police officials to locate the child anywhere in India. When a child is found, the photograph at that time is matched against the images uploaded by the Police/guardian at the time of missing. Sometimes the child has been missing for a long time. This age gap reflects in the images since aging affects the shape of the face and texture of the skin. The feature discriminator invariant to aging effects has to be derived. This is the challenge in missing child identification compared to the other face recognition systems. Also facial appearance of child can vary due to changes in pose, orientation, illumination, occlusions, noise in background etc. The image taken by public may not be of good quality, as some of them may be captured from a distance without the knowledge of the child. A deep learning [1] architecture considering all these constrain is designed here. The proposed system is

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## An Automatic online User data verification and comparison from E-Government using AI

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### ABSTRACT

In a rising number of disciplines, artificial intelligence (AI) has recently improved state-of-the-art outcomes. However, it continues to encounter a number of issues that limit its deployment in e-government applications, both to enhance e-government interactions with individuals and e-government systems. In this article, we discuss the problems with e-government systems and suggest a paradigm for automating and facilitating e-government functions. In particular, we present a framework for the management of electronic resources for government information. The second step is to create a collection of deep learning models with the goal of automating various e-government services. Third, we suggest an intelligent e-government platform architecture that enables the creation and execution of AI e-government applications. Our primary objective is to advance the existing state of AI by using reliable AI methodologies of e-government services in order to minimize processing times, reduce costs, and improve citizens' satisfaction.

**Keywords:** Artificial intelligence, deep learning, E-government, web services.

### INTRODUCTION

Artificial intelligence (AI) has been around for a while in a variety of theoretical forms and complex systems, but it has only recently been made possible by breakthroughs in computing power and massive data to achieve spectacular outcomes in an expanding range of disciplines. Computer vision, medical applications, natural language processing, reinforcement learning, and a number of other fields, for instance, have all greatly benefited from AI. The ability of a computer to mimic the intelligence of human behavior while enhancing its own performance is known as artificial intelligence (AI). AI, which is not just robotics but rather the intelligent behavior of an autonomous machine that characterizes the machine's mind rather than its body, is capable of driving a car, playing video games, and carrying out a variety of complex tasks. AI is a field that falls at the intersections of several other domains, including Machine Learning, Deep Learning, Natural Languages Processing, Context Awareness, and Data Security and Privacy. Figure 1 illustrates the intersections and relationship of the AI field with related fields.

Machine Learning (ML) is the ability of an algorithm to learn from prior data in order to produce a smart behavior and make correct decisions in various situations that it has never faced before. ML algorithms are enabled by training computational model, which is the process of exposing an algorithm to a large dataset (e.g., citizens' demographics) in order to predict future behaviors (e.g., employment rates). The process of learning from prior datasets is known as a supervised learning. Unlike traditional ML algorithms, Deep Learning, a subfield of ML, has emerged to overcome the limitations of prior ML algorithms. Deep learning can be defined as a mapping function that maps raw input data (e.g., a medical image) to the desired output (e.g., diagnosis) by minimizing a loss function using some optimization approach, such as stochastic gradient descent (SGD). Deep learning algorithms, inspired by the neural networks in the human brain, are built with a large

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Analysis on left duo  $\Gamma$ -Seminearrings based on salient features and characteristics<sup>1</sup>K Narendar Reddy, <sup>2</sup>K Sridhar, <sup>3</sup>U Renuka, <sup>4</sup>Kunchala Sravanthi<sup>1,2,3</sup> Assistant Professor, <sup>4</sup>UG Student, <sup>1,2,3,4</sup>Department of Mathematics, Kasireddy Narayanreddy college of engineering and Research, Hyderabad

**Abstract:** The purpose of this essay is to examine the left pair of  $\Gamma$ -earrings. We demonstrate some of the key characteristics of the left pair of  $\Gamma$ -earrings. We further describe such a  $\Gamma$ -seminearring.

AMS Subject Classification (2010): 16Y30, 16Y60, 16Y99

**Keywords:**  $\Gamma$ -seminearring, ideal, left-ideal.

### 1. Introduction

$\Gamma$ -Seminearring, which Hoorn and Rootselaar[1] established, is a more general algebraic structure than a nearring or a semiring. Consider a non-empty set as a semigroup with one distributive law and two binary operations, where  $(R, +)$  and  $(R, \cdot)$  denote the semigroup. The  $\Gamma$ -seminearring structure is used extensively in theoretical computer science, including semigroup mapping, reversible computing models, and algebra communication processes. studies of cryptography theory and issues identified in [2]. Let  $R$  be a semigroup that adds. Let  $R \rightarrow R$  be the set of all mappings of  $R$  into itself, using point wise addition operations: In addition, multiplication is determined by the composition of the maps:  $r(a\beta) = (ra)\beta \forall r \in R$ . Then  $(M(R), +, \cdot)$  is a  $\Gamma$ -seminearring.

In 1964, Nobusawa introduced  $\Gamma$ -rings.  $\Gamma$ -nearrings defined in 1984 by Satyanarayana and Rao studied  $\Gamma$ -semirings in 1995. It is known that  $\Gamma$ -rings and  $\Gamma$ -nearrings are generalisations of each other.  $\Gamma$ -rings,  $\Gamma$ -nearrings and  $\Gamma$ -semirings are the generalisations of rings, nearrings and semirings respectively.



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## An approximate calculation of the sodium atom's monochromatic light wave's overall length

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### Abstract

Since light is a wave, it is possible to estimate its wavelength, frequency, and speed; nevertheless, the entire length of a single light wave emitted by an atom has not yet been determined. Since the time required for the electron to go from a higher to a lower energy level in an atom is finite, the resulting light wave that is emitted must also be finite in length. It is discovered to be helpful to roughly estimate the length of a monochromatic light wave generated by a sodium atom by using a straightforward air-wedge technique experiment, which is typically carried out to assess the thickness of a thin wire in lower division physics laboratories.

**Keywords:** Frequency, Wavelength, Single Light Wave, Newton's Ring Experiment, Air-Wedge Method

### Introduction

One of the most fundamental areas of physics is the wave theory of light, coupled with optics. Not only is light the most available energy source in nature, but most species, including humans, utilize light to detect their surroundings. It is an essential component of life, yet we are unable to fully comprehend its nature, leading to the ongoing controversy over whether light is made up of particles, waves, or both. Initially, Newton hypothesized in 1704 that white light is composed of several hues, which he separated using prisms, and he suggested that the light must comprise particles of various colors moving quickly [1]. Meanwhile, Huygens proposed that the light contains number of waves and its different colors are due to the different wavelengths of the waves contained in it [2-4]. The Huygens's wave theory of light was further supported by Thomas Young in 1804 by performing double slit experiment which could be explained by the Huygens wave theory [5]. While solving the crisis of photoelectric effect Einstein, in 1905, proposed that light could behave as a wave as well as particle [6]. Today particle nature as well as wave nature of the light has been accepted widely where Optics deals with its wave nature on the other hand Quantum mechanics deals with its particle nature. While dealing with wave nature of light, we know its wavelength, frequency and speed too but we don't know about its physical dimensions means total length and exposure area of the wave at the instant of its emission from its parent atom. The transition of electron from its higher energy level to the lower one, responsible to produce the light wave, should take finite time consequently the total length of the corresponding wave emitted there should have finite length. However, it could be how much long is not estimated yet. Here we describe how one can estimate the total length of single continuous wave of sodium light using simple air-wedge method.

### Research Methodology

#### Newton's Ring Experiment

While dealing with wave nature of light, we know its wavelength, frequency and speed. We don't know yet about the total length of the light wave at the instant when it is emitted by an atom. The time taken by an electron for transition from its higher energy level to lower energy level in an atom should be finite. Therefore, the total length 'L' of the light wave emitted in this process should be finite. However, it could be how much long for a particular transition of the electron is not estimated yet.

The Newton's ring experiment is generally performed to determine average wavelength of sodium light. Typical students are always interested to know how many rings are formed there just because of their curiosity. They face difficulty due to decreasing width of the rings going away from the center where the colour gets diffused more and more. How many rings should be formed there, in fact, gives important message about the total length of the single light wave involved there and is being ignored always.

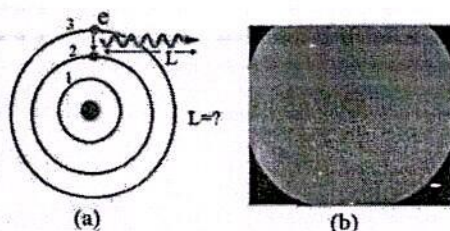


Fig. 1 (a) Demonstration of total length 'L' of single light wave emitted by an atom, (b) Interference pattern of Newton's

## An approximate calculation of the sodium atom's monochromatic light wave's overall length

<sup>1</sup>Dali Sai Bhavani, <sup>2</sup>Ch Ranga Rao, <sup>3</sup>Pratap Pola, <sup>4</sup>A Jagan

<sup>1,2,3</sup> Assistant Professor, <sup>4</sup>UG Student, <sup>1,2,3,4</sup> Department of Physics, Kasireddy Narayanreddy college of engineering and Research, Hyderabad

### Abstract

Since light is a wave, it is possible to estimate its wavelength, frequency, and speed; nevertheless, the entire length of a single light wave emitted by an atom has not yet been determined. Since the time required for the electron to go from a higher to a lower energy level in an atom is finite, the resulting light wave that is emitted must also be finite in length. It is discovered to be helpful to roughly estimate the length of a monochromatic light wave generated by a sodium atom by using a straightforward air-wedge technique experiment, which is typically carried out to assess the thickness of a thin wire in lower division physics laboratories.

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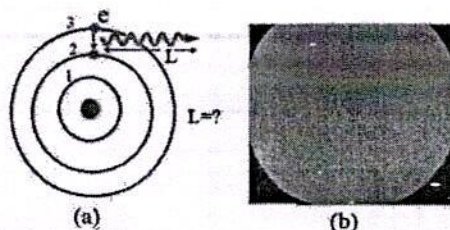


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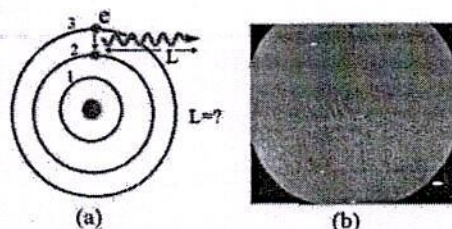


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Analysis on using the Harry Harrison novel Make Room! Make Room! As a point of reference  
examine the effects of overpopulation on the environment and economic development

<sup>1</sup>Shake Mahammad Ghouse, <sup>2</sup>S Jan Reddy, <sup>3</sup>M Pravalika, <sup>4</sup>N Rajashekhar  
<sup>1,2,3</sup> Assistant Professor, <sup>4</sup>UG Student, <sup>1,2,3,4</sup> Department of English, Kasireddy Narayanreddy college of  
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### Abstract

Since it has sparked a number of undesirable environmental consequences, overpopulation has long been recognized as a threat to the planet's ecosystem. Because emerging countries are under pressure to become economically powerful, their industrial developments also harm the environment, even though developed countries use and recapitulate the environment's resources. The future of our generation on earth is in danger because of this development. In addition, the issue of global warming is one of the largest environmental risks brought on by the population expansion. Our experts continue to caution that this slow increase in population has an impact on global warming, which will cause sea levels to rise and bring on unpleasant weather conditions in the future. The current environmental cycle is directly harmed by over population. For example, to fulfill the requirement of the population density forests are cutting in a frightening manner. Despite deforestation, urban sprawl, food insecurity, climate change, and declining incapacity are some of the most severe impacts of population explosion. The objective of this paper is to analyze the hazards of Overpopulation on the environment and economic advancement by taking the reference of the novel Make Room! Make Room! by Harry Harrison as the basis of the study. The present study is based on textual analysis of the novel along with secondary data taken from statistical abstracts, census reports and world population report, and various websites related with the theme.

**Keywords:** Overpopulation, Environment, Soylent, Epidemic, Pollution.

### Introduction

According to Samgraha 562, "Ati Sarvatra Varjayet" (an excess of anything is detrimental) signifies. Although, according to the Bible and other religious texts, humans are among God's best creations. However, when this lovely product of God pushes the bounds and interferes with natural cycles, it now threatens the functionality of other creations of the Almighty. There are an infinite number of mouths in the world today, but there is a finite amount of food. As a result, the needs of the entire population cannot be met by the resources at hand. In this approach, overcrowding is a serious issue since these natural resources are rapidly depleting. Population explosion causes environmental damage including deforestation, pollution of different kinds i.e., air pollution, water pollution, noise pollution, etc. The condition of overpopulation gives birth to a condition, a scuffle for resources.

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## Reduction of N-ethyl-3-nitro indole with sodium dithionite and 0.5 (N) sodium hydroxide solutions by preparing N-ethyl-3-amino indole

<sup>1</sup>Uma Sundari Maruthi, <sup>2</sup>Ch Sarika, <sup>3</sup>Satyanarayana Reddy, <sup>4</sup>G Venu Madhav

<sup>1,2,3</sup> Assistant Professor, <sup>4</sup>UG Student, <sup>1,2,3,4</sup>Department of Chemistry, Kasireddy Narayanreddy college of engineering and Research, Hyderabad

### Abstract

By reacting 3-nitro indole with ethyl iodide in the presence of sodium hydride, N-ethyl-3-nitro indole was created. By reducing N-ethyl-3-nitro indole with sodium dithionite and 0.5 (N) sodium hydroxide solutions in the solvent medium of ethanol at 500°C, N-ethyl-3-amino indole was created. The reaction of N-ethyl-3-amino indole with 4-fluoronitro benzene in the presence of cesium fluoride in the solvent medium of DMSO under reflux at 1200C for 20 hours produced N-ethyl-3-(4,4'-dinitro diphenyl amino) indole. N-ethyl-3-(4,4'-dinitrodiphenyl amino) indole was reduced with palladium-carbon under reflux at 1300°C for 12 hours to produce N-ethyl-3-(4,4'-diamino diphenyl amino) indole. N-ethyl-3-(4,4'-diamino diphenyl amino) indole and 6FDA were combined in a 1:1 molar ratio and heated for 24 hours at 400°C to create polyamic acid which was subsequently treated with acetic anhydride and pyridine at 1000c for 24h in the solvent medium of DMF.

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## USAGE OF QUANTITATIVE RESEARCH METHODOLOGY TO ANALYZE CONSUMER BUYING ACTIONS IN RELATION TO ONLINE SHOPPING

<sup>1</sup>S.JAYADEVA REDDY, <sup>2</sup>R.RAVINDER, <sup>3</sup>G.RISHITHA, <sup>4</sup>U.AMALA

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### ABSTRACT

The development of technology and human lifestyles has given businesses excellent opportunity to reach customers more quickly, easily, and affordably. The manner that consumers shop has drastically changed during the last ten years. Even while consumers continue to shop in-person, they find online shopping to be more convenient. Modern folks save time by shopping online because they are too busy to spend much time on traditional shopping due to their busy schedules. While it comes to the product, pricing, features, quality of the product, service, packaging, buying behavior, status, generation, and age of the client, consumer behavior varies, which has an impact on purchase intentions when shopping online. The data was collected through a structured questionnaire which contains closed ended questions. Data collected for the studies includes both Primary and Secondary data. The Primary data was collected through a questionnaire by using google forms. This survey was conducted from students. Secondary data was collected through websites. A quantitative research methodology was used and 124 randomly selected respondents are participated in the study.

**Keywords:** Buying, Behavior, Consumer, online, shopping.

### INTRODUCTION

Online shopping is the simple solution to modern society's hectic lifestyle. Customers who prefer to purchase in actual stores find online reservations easy. Modern people benefit greatly from online booking because they are so busy these days that they cannot spend time looking. A company's main objective is to provide goods and services that best meet the needs of its customers. Understanding consumer acceptance of online buying is particularly crucial for e-retailers because of the intense competition in this market. Customer relationship management, which has been recognized as an efficient company approach to succeed in online buying, requires knowledge. E-consumer behaviour refers to the process of purchasing products or services using the internet. When consumers recognize a need for some product or service, they go to the shopping sites and search for need related information about products or services. They then evaluate alternatives and choose the one that best fits their criteria for meeting the need. The major objective of e-retailers is to identify the factors influencing e-consumers behaviour. The purpose of this study is to examine e-consumers buying behaviour towards online shopping. The main objective of the study is to study the demographics, comparison of different e-retailers on the basis of trust, discount, schemes, services and quality, perception.

### OBJECTIVES OF THE STUDY

1. To study the consumer buying behaviour towards online shopping.
2. To know the preference of different online shopping sites.
3. To examine the problems of consumer while dealing with online shopping.

## USAGE OF QUANTITATIVE RESEARCH METHODOLOGY TO ANALYZE CONSUMER BUYING ACTIONS IN RELATION TO ONLINE SHOPPING

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### ABSTRACT

The development of technology and human lifestyles has given businesses excellent opportunity to reach customers more quickly, easily, and affordably. The manner that consumers shop has drastically changed during the last ten years. Even while consumers continue to shop in-person, they find online shopping to be more convenient. Modern folks save time by shopping online because they are too busy to spend much time on traditional shopping due to their busy schedules. While it comes to the product, pricing, features, quality of the product, service, packaging, buying behavior, status, generation, and age of the client, consumer behavior varies, which has an impact on purchase intentions when shopping online. The data was collected through a structured questionnaire which contains closed ended questions. Data collected for the studies includes both Primary and Secondary data. The Primary data was collected through a questionnaire by using google forms. This survey was conducted from students. Secondary data was collected through websites. A quantitative research methodology was used and 124 randomly selected respondents are participated in the study.

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## MARKETING STRATEGIES IN BANKING SECTOR - A REVIEW

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### ABSTRACT

*Indian banking sector historically passed through five stages: pre-independence, post-independence, pre-nationalization, nationalization and post-liberalization stages. In all these stages, other than the last stage, marketing was always considered not to be a banker's cup of tea. But today, it is considered to be an integral management function in the banking sector. India's banking sector has made rapid strides in reforming and aligning itself to the new competitive business environment. Traditionally, Indian banks have not really paid adequate attention to marketing and market research. The paper is a review of marketing strategies prevalent in the Banking Sector. In this era of mature and intense competitive pressures, it is imperative that banks maintain a loyal customer base. Nowadays, banks realize the importance of Relationship Marketing. Relationship marketing offers benefits to the banks, customers as well as employees of the organization. Relationship Marketing gives the banks a way to develop mutually beneficial and valuable long term relationships. These long term relationships are further helping banks in reducing operating cost and attracting new customers.*

**Key Words:** Nationalization, strategies, marketing

### INTRODUCTION

The banking sector is an integral part of the economy. Hence this sector plays a key role in the wellbeing of the economy. A weak banking sector not only jeopardizes the long-term sustainability of an economy, it can also be a trigger for a financial crisis which can lead to economic crises. Majority of the banking institutions are now putting emphasis on marketing to make customer aware about the services and benefits offered by them. Marketing is the crucial connection between banks and customers, no banks can expect to succeed without putting substantial investments in its marketing efforts. Banks nowadays are coming up with surprising and impressing ways to lure the customers and retaining their customer base. These days' banks are focusing heavily on building long term relationships with their existing customers and thereby gaining new customers. Hence, relationship marketing becomes very important for the banks. It is concerned with mapping out all the touch point and evaluating what services are provided, by whom, and when, and how, and what is expected by customers. The definition of bank marketing is as follows: "Bank marketing is the aggregate of functions, directed at providing services to satisfy customers' financial (and other related) needs and wants, if more effectively and efficiently than the competitors keeping in view the organizational objectives of the banks." All the techniques and strategies of marketing are used so that ultimately they induced the people to do business with the particular bank. To create and keep a customer means doing all those things so that people would like to do business and continue to do it with the particular bank rather than with the competitors. It