

## CNC MACHINES – CASE STUDY AND PART ANALYSIS

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### ABSTRACT

Computer numerical control setups have begun to pop up in the manufacturing industries across the world due to their high efficiency and minimal dependence on human labor. In this research paper, we aim to understand the in depth functioning of CNC machines, perform different analysis and finally suggest a vast no. of ways in which these manufacturing marvels can be implemented into different industries. Under the analysis aspect of this research paper, we have performed the analysis of miller beds with the base materials as Cast Iron, Stainless Steel and Carbon reinforced polymer using state of the art analysis software like Ansys and we have tried to understand the differences between these materials using their Stress and Strain analysis on Ansys. After understanding the role of CNC machines and the efficacy of different materials, we have provided multiple future applications of the CNC technology in varied industries.

### INTRODUCTION

CNC machining is a manufacturing process in which pre-programmed computer software dictates the movement of factory tools and machinery. The process can be used to control a range of complex machinery, from grinders and lathes to mills and routers. With CNC machining, three-dimensional cutting tasks can be accomplished in a single set of prompts. When a CNC system is activated, the desired cuts are programmed into the software and dictated to corresponding tools and machinery, which carry out the dimensional tasks as specified, much like a robot. The programs for CNC machines are fed to computers through small keyboards instead of heavy-duty systems. CNC programming is retained in a computer's memory. The code itself

is written and edited by programmers. Therefore, CNC systems offer far more expansive computational capacity. Best of all, CNC systems are by no means static, since newer prompts can be added to pre-existing programs through revised code. Abbreviated as CNC, the Computer Number Control processes run in contrast to and much more efficiently than manual control, where live operators are absolutely necessary to operate the machining tools via levers, buttons and wheels. To the layman, a CNC system might not look very visually different from a generic computer system, but the software programs and the state-of-the-art components employed in CNC machining makes it stand out from all other forms of computation.

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## The Ligand-Free N-Arylation of 1,2,4-triazoles at Room Temperature

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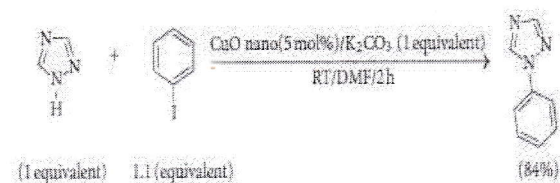
### Abstract:

By using prominent (111) facet Cuco nanoparticles as a catalyst in a ligand-free state, a straightforward and effective technique for N-arylation of 1,2,4-triazole at room temperature was developed. In addition to the catalyst's reusability, a wide range of substrates provides a high yield of N-arylation product in a relatively rapid reaction time. Since this catalyst is so versatile, we looked at transformations involving less reactive nitrogen nucleophiles such as imidazole and pyrazoles. We were pleasantly surprised to discover that several different azole derivatives may be coupled efficiently with aryl iodide to produce the required N-arylated product.

### Introduction

Due to their versatility in biology and increasing interest as hole-transport molecules for organic light-emitting diodes (LEDs), N-aryl derivatives of azoles have emerged as a key class of organic chemicals for organic synthesis. Metal-mediated processes such as the Ullmann coupling [1, 2], aromatic nucleophilic substitution [3, 5], and Pd or Cu catalysed arylation [6] were used to N-arylate azole. However, their usefulness was limited, particularly for industrial-scale production, due to the need of using a chelating ligand, a stoichiometric quantity of Cr (CO), and severe reaction conditions. The N-arylation of azoles with aryl halides catalysed by transition metals is one of the most potent and effective ways for the production of N-aryl derivatives [7, 8]. However, there may be limits to present approaches due to the high cost of the transition-metal catalysts required for these conversions. These catalysts include palladium [9], rhodium [10], nickel [11], and cobalt [12] complexes. For this reason, it is currently difficult to filter out metal catalysts for the N-arylation of azoles that are both cheap and safe for the environment [13]. Copper catalysts functionalized with a wide variety of ligands proved to be a cheap and effective tool for the N-arylation of nitrogen-containing heterocycles with aryl halides. The Cu-catalysed reactions used a wide variety of ligands, such as beta-diketones [14], 1,2-diamines [15], phenanthrolines [16], bipyridines [17], -amino acids [18], phosphines [19], and others [20]. An essential function of chelating ligands is to regulate the concentration of active catalytic species, although these ligands might potentially introduce

unwanted impurities into the final products [21]. To save time and effort, catalysts that don't need ligands could be a viable option. Chui [22] and Cu<sub>2</sub>O [23] have been used as catalysts for this cross-coupling reaction in the absence of organic ligands with great success in recent years. However, these catalytic systems often need either an abundance of substrates or a substantial loading of catalysts [24]. This kind of coupling reaction was found to be catalysed by simple inorganic copper (II) salts without the need for any additional ligands [25]. For the first time, Route Tal has reported using Cuco nanoparticles in a cross-coupling process. [26]. Efficacious catalysts for organic synthesis have been investigated, and they are found to be Cuco nanoparticles with a high surface area and reactive morphologies [27, 28]. Cuco nanoparticles were of great interest because of their potential applications in catalysis, metallurgy, and high-temperature superconductors [29, 30]. It was discovered that these nanoparticles are efficient catalysts for the oxidation of CO and NO.



SCHEME 1: N-arylation of 1,2,4-triazole.

other than methanol and oxidation of other volatile organic chemicals [31, 32]. Nanocrystalline Cuco has been used in new asymmetric processes reported by Kanam et al. [33, 34]. These reactions include the hydrolysis of prochiral ketones, the direct aldol reaction, and the N-arylation of heterocycles. The catalytic operations were carried out by the Cuco nanoparticles' (111) plane, which has a larger number and higher density of active sites



## Power Factor Correction of Three-Phase PWM AC Chopper Fed Induction Motor Drive System Using HBCC Technique

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### ABSTRACT:

The paper provides modeling and simulation of a single-phase AC-DC hybrid microgrid's power flow control strategy (HMG). The recommended system topology for HMG includes an ordinary H-Bridge inverter/rectifier, a full bridge IGBT structure, two air conditioners, and DC areas that are separated by a bidirectional interlinking converter (BIC). Based on the DQ change principle, two power control loops and one voltage control loop (Vdc) supply the BIC's changing pattern. The transmission of active and reactive power between the HMG and the public a/c Grid is permitted by this control approach in a controlled manner. Additionally, by utilising the bidirectional converter in correcting or inverting settings, this is carried out in both instructions. Matlab Simulink is used to execute and evaluate the simulation design.

**Key words:** *micro grid, HMG, Vdc, DQ, and BIC.*

### 1 ANNOTATION

In an AC-DC hybrid microgrid, the continuous power supply of the customers

necessitates the development of a stable conversion system capable of initiating the islanding process when an unexpected event

## DESIGN A HIGH-PRECISION VLSI ARCHITECTURE OF RECONFIGURABLE FFT PROCESSOR

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**ABSTRACT:** In this paper the design a high-precision VLSI architecture of reconfigurable FFT processor is implemented. Basically the FFT supports the bit size which is suitable to the system and mostly used in the long term evolution systems. Transport triggered architecture is utilized to customize the size of fault free FFT processor. Here the both energy-efficiency and performance is evaluated by using the standard cell technology. Computing address unit generates the address to access the main memory. Barrel shifter is used to shift the position of bits. Data merging block will merge the bits very effectively. All the shifter data and merged data is saved in the data memory blocks. Memory access controller will control the data while accessing to the reconfigurable unit. Twiddle factor is used to speed the operation of system. At last from simulation result it can observe that reconfigurable FFT processor gives effective outcome.

**KEY WORDS:** FFT, Data merger, Barrel shifter cluster, Memory Access controller, Twiddle factor.

### I. INTRODUCTION

Generally, discrete Fourier transform is introduced in 1965. Basically, the discrete Fourier transform is taken from the fast Fourier calculation. All things considered, after practically 50 years, stays extremely high because of key helpful properties of DFT. The ongoing increase in such intrigue is because of correspondence applications, specifically Long Term Evolution (LTE) and Software Defined Radio (SDR) [1]. In these applications, productive usage of DFT are required so as to help very tight, commonly negating limitations, for example, hard ongoing necessities over low-control, Minimal effort and adaptable HW stages. In the OFDM images using the Discrete Fourier to obtain the high speed operation in the system.

Here the length of each image is considered as  $N$  and these produces complex quantities in the entire system. Hence the vector image is used with the length of  $N = 128$ . In the Meantime, the plan eases to be valuable and the primary target gadgets are compact purchaser Electronics, for example, portable (advanced cells,) workstations, and so forth. Then again, plans of action require adaptable programmable usage [2].

Basically, the main intent of filters is to use partial range of frequency to emphasize the signals. But here the signals are getting rejected because of selection of frequency range in alternate way. Coming to the designing part of circuit, the frequency is selected alternatively. Here the frequency range is connected to the electric network. This electric network works depending on the characteristics of signals. The characteristic parameters are amplitude, frequency and time [3].

Depending on these parameters the entire electric network works. Here this may come to know that, there will be no change in allotted frequency and as well as cannot add new frequency to the system. Filters are mainly used in the applications of medical, automotive. There is a unity of region with some very surprising bases of characterization channels and these cover in some unique ways; there is no direct hierarchical grouping. As the social properties of the sign change, separation strategies will be considered. FFT is an elective calculation procedure for discrete Fourier change as it registers





## A NOTE ON HEAT TRANSFER OF MHD JEFFREY FLUID OVER A STRETCHING VERTICAL SURFACE THROUGH POROUS PLATE

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### ABSTRACT

This research note's objective is to elaborate the study of MHD Jeffrey fluid over a stretching vertical surface an accelerated porous plate with heat source. The fluid flow phenomenon happens in a stretching vertical surface immersed in a porous medium. The mathematical model is presented with the system of the partial differential equations along with physical conditions. Appropriate dimensionless model is transformed into similarity transformations, which are solved numerically using finite difference scheme. The influences of various pertinent parameters on the flow involving in the governing differential equations are discussed through graphs.

**KEYWORDS:** Jeffrey fluid, Stretching surface, Porous plate, Heat transfer

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### INTRODUCTION

The Jeffrey fluid model is capable of describing the stress relaxation property of non-Newtonian fluids, which the usual viscous fluid model cannot describe. Class of non-Newtonian fluids having the characteristic memory time scale, also known as the relaxation time, can be described well by the Jeffrey fluid model. The interest developing in the studies of non-Newtonian fluid in the last few years is owing to its implementation in industry and

technology. Some of the common examples of the non-Newtonian fluid are honey, polymer solution, gel, blood, macro-molecules solutions, and many others. The nonlinear rheological properties of the non-Newtonian fluid are one of the major aspects of its importance. Many rheological problem applications are observed in the field of geophysics, bioscience, cosmetics, during of paper, food processing, chemical plastic suggested explicating the rheological conduct







## MHD EFFECT ON BOUNDARY LAYER FLOW OF AN UNSTEADY INCOMPRESSIBLE MICROPOLAR FLUID OVER A STRETCHING SURFACE

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### ABSTRACT

The present investigation is the effect of magnetohydrodynamic on unsteady boundary layer flow of an incompressible micropolar fluid over a stretching surface when the sheet is stretched in its own plane with time dependent is studied. The governing partial differential equations are solved by Adams predictor-corrector method. The results for various parameters involving in governing equations are discussed by graphically.

**Key words:** Unsteady Flow, MHD, Micropolar Fluid, Stretching Sheet

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### INTRODUCTION

The fluid dynamics over a stretching surface is important in extrusion process. The production of sheeting material arises in a number of industrial manufacturing process and includes both metal and polymer sheets. Examples are numerous and they include the cooling of an infinite metallic plate in a cooling bath, the boundary layer along material handling conveyers, the aerodynamic extrusion of plastic sheets, the boundary layer along a liquid film in condensation process, paper production, glass blowing, metal spinning, and drawing plastic films, to name just a few. The quality of the final product depends on the rate of heat transfer at

the stretching surface. As many as we observed some of the authors demonstrated by (Ariman et. al, 1973) has been considered Microcontinuum fluid mechanics- a review,( Anjalidevi and Ganga, 2010) expressed their ideas on dissipation effects on MHD nonlinear flow and heat transfer past a porous medium with prescribed heat flux, (Crane, 1970) motivated study on flow past a stretching plane, (Eringen, 1964) illustrated on simple micropolar fluids, (Eringen, 1966). Theory of micropolar fluids, (Gorla, 1983) observed on micropolar boundary layer flow at stagnation point on a moving wall, (Guram and Smith, 1980), expressed their views on stagnation flows of micropolar fluids with strong and weak interaction, (Ishak et. al, 2008)





## CHEMICAL REACTION, HEAT AND MASS TRANSFER EFFECTS ON MHD PERISTALTIC TRANSPORT IN A VERTICAL CHANNEL THROUGH SPACE POROSITY AND WALL PROPERTIES

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### ABSTRACT

The present paper analyzed on magnetohydrodynamic peristaltic transport flow of a Newtonian fluid through porous space in a vertical channel with compliant walls under the assumptions of long wavelength and low Reynolds number with chemical reaction, heat and mass transfer. The governing partial differential equations derived and solved by using perturbation method. The physical behaviour of different parameters for velocity, temperature and concentration profiles has been examined through graphically and the phenomenon of trapping has been discussed.

**Keywords:** Peristalsis, Porous space, Hartmann number, Schmidt number, Chemical reaction

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### INTRODUCTION

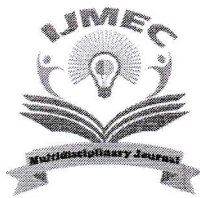
The study of peristalsis has received considerable attention in the last four decades mainly because of its potential application to the biological systems. It is a mechanism for fluid transport which is achieved by the passage of progressive waves of area contraction and expansion over flexible walls of a tube containing fluid. The word peristalsis stems from the Greek word 'peristaltikos' which means clasp-

compressing. It consisting narrowing and transverse shortening of apposition of a tube, which then relaxes, while a lower portion becomes shortened and narrowed. Some worms like earth-worm use peristalsis for their locomotion. From fluid mechanical point of view peristaltic pumping is characterized by the dynamical interaction of fluid flow with movement of flexible boundaries. Peristalsis appears to be the major mechanism for urine transport of spermatozoa in the ducts efferentes of the male reproductive organs,

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## MONITORING ENVIRONMENTAL PARAMETERS AND DEVICE CONTROL VIA IOT (INTERNET OF THINGS)

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**Abstract:** This paper focuses on the functional design and implementation of a Wireless Sensor Network (WSN) platform tailored for long-term environmental monitoring within IoT applications. The platform's specifications take into account various application requirements such as low cost, high quality of service, extended lifespan, minimal maintenance, rapid deployment, and low power consumption. With notable transformations occurring in industrial process control, intelligent building management, and automation technologies, there is mounting pressure to reduce operational expenses while incorporating significant advancements in telecommunications and software. Software has emerged as a critical component in both production and enterprise-wide systems, while internet connectivity has revolutionized monitoring and control arrangements. Moreover, the utilization of open/public standards and personal computing devices (including PCs, tablets, and smartphones) offers substantial benefits to users and manufacturers alike. These developments have paved the way for a new Industrial Revolution, characterized by the integration of the Internet of Things (IoT) into industrial processes.

**Keywords.** Arduino, NodeMCU, Moisture Sensor, LDR Sensor, Lm35, LCD

### 1. INTRODUCTION

More than decade ago, the Internet of Things (IoT) was coined in which the computers were able to access data about the objects and environment without human interaction. Two technologies were considered as key enablers for IoT paradigm: Radio Frequency Identification (RFID) and the Wireless Sensor Network (WSN). While the former is well established for low cost identification and tracking, WSN bring IoT applications richer capabilities for both sensing and actuation. In fact, WSN solution already covers a broad range of research and technology advances continuously expand their application field. Based on the advantages WSN concepts bring to a vast amount of different applications, interest in the corresponding technology is high. Ideally, the WSN allows for

the deployment of large amount of sensor nodes, which configure themselves, depending the network topology and neighborhood situation. After sensing the physical environment and processing the obtained data locally, nodes communicate their data towards a network sink, where data is further processed and made available for readout. As transmitted data should find the best route towards its destination automatically. A Environmental Monitoring Although EM can mean the monitoring of any kind of environment, it is most often defined as the observation and study of natural environment. Scientifically, EM includes the field the of physics, chemistry and biology. The motivation based on the ever increasing the world population, means that environmental monitoring is not limited to the understanding of environments, but also includes the monitoring



## SPEECH-TO-INDIAN SIGN LANGUAGE (ISL) CONVERSION SYSTEM

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**Abstract:** Communication plays a critical role for people and is regarded as a skill in life. Having this important aspect of life and surroundings in mind, we present our project article, which focuses primarily on supporting patients with pain or silent speech. Our research work leads to improved contact with the deaf and the mute. Each sign language uses sign patterns visually conveyed to express the true meaning. The combination of hand gestures and/or motions of arm and body is called Sign Language and the Dictionary. It is the combination of hands and facial expressions. Our program project is able to understand signals in sign language. These symbols may be used to interact with hearing aids. Our article suggests a program that allows common people to interact effectively with others that are hard to understand. In this case, we are implementing the Indian Sign Language (ISL) method by using a microphone and a camera. Translation of the voice into Indian sign language system by the ISL translation system is possible. The ISL translation framework uses a microphone to get pictures (from ordinary people) or continuous video clips, which the application interprets.

### 1. INTRODUCTION

Sign language is a language that consists of signs made with hands and other movements, facial expressions and postures of body, which is primarily used by people who are deaf or hard hearing peoples that they can easily express their thoughts or can easily communicate with other people. Sign language is very important a far the deaf people are concerned for their emotional, social and linguistic growth. First language for the deaf people is sign language which get proceeded bilingually with the education of national sign language as well as national written or spoken language. There are different communities of deaf people all around the world therefore the sign language for these communities will be different. The different sign languages used by different communities are: America uses American Sign Language, Britain sign language is used by Britain, similarly, India uses Indian sign language etc. For expressing thoughts and communicating with each other. Manual communication and body language is used by Indian sign language to convey thoughts, feelings and ideas. ISL is classified into two classes: manual and non-manual signs. One handed and two handed are part of manual sign where the information is being conveyed by the signer using his/her hands to make the sign.

### 2. RELATED WORKS ON TRANSLATION

A movement made using part of body, especially using hands, arms, face, head to express meaningful information or emotions is known as gesture. Gesture recognition is valuable in applications that involve human machine interaction. Tools used to survey gesture recognition is Hidden Markov models (HMMs), particle filtering and condensation model and finite state machine (FSM). The sign language translation system converts speech to sign. Speech recognizer is used for decoding the spoken voice into word sequence and to converts that word sequence into sequence of signs a natural language translator is used.

#### 2.1 Speech to Sign Translation

Speech is taken as an input by a normal person using a microphone of a cellular phone or computer. For voice signal to be of good quality it will be sent for voice removal. With the help of a trained voice database, voice to text conversion takes place i.e., voice is converted into text-by-text recognition module. Meanings and symbols are found by comparing the database and converted text and then the sign symbols are displayed with text to hard hearing person.

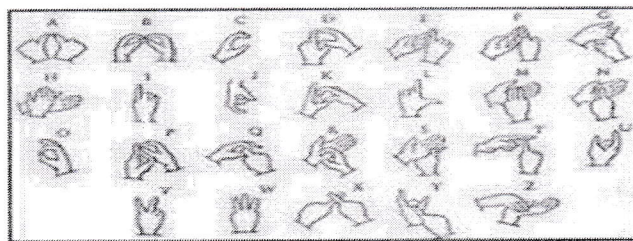


Fig-1: Indian Sign Language Alphabet Series

#### 2.2 Noise Removal

Noise removal is the process of removing the unwanted noise or any absurd noise from the input data which is in takes in terms of speech. Different types of noise removal techniques are Filtering technique, spectral restoration and many more. Modulation detection and synchrony detection are the two noise removal techniques. Since the speech from the user or the normal person is taken using a microphone of computer or a cellular phone clarity of sound may not be guaranteed therefore it is sent to the noise removal.



## **SPEECH-TO-INDIAN SIGN LANGUAGE (ISL) CONVERSION SYSTEM**

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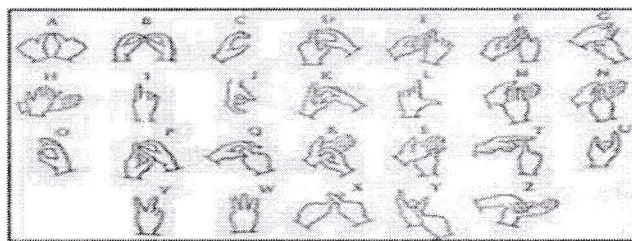
Sign language is a language that consists of signs made with hands and other movements, facial expressions and postures of body, which is primarily used by people who are deaf or hard hearing peoples that they can easily express their thoughts or can easily communicate with other people. Sign language is very important a far the deaf people are concerned for their emotional, social and linguistic growth. First language for the deaf people is sign language which get proceeded bilingually with the education of national sign language as well as national written or spoken language. There are different communities of deaf people all around the world therefore the sign language for these communities will be different. The different sign languages used by different communities are: America uses American Sign Language, Britain sign language is used by Britain, similarly, India uses Indian sign language etc. For expressing thoughts and communicating with each other. Manual communication and body language is used by Indian sign language to convey thoughts, feelings and ideas. ISL is classified into two classes: manual and non-manual signs. One handed and two handed are part of manual sign where the information is being conveyed by the signer using his/her hands to make the sign.

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**Fig-1: Indian Sign Language Alphabet Series**

#### **2.2 Noise Removal**

Noise removal is the process of removing the unwanted noise or any absurd noise from the input data which is in takes in terms of speech. Different types of noise removal techniques are Filtering technique, spectral restoration and many more. Modulation detection and synchrony detection are the two noise removal techniques. Since the speech from the user or the normal person is taken using a microphone of computer or a cellular phone clarity of sound may not be guaranteed therefore it is sent to the noise removal.



**Authors: Dr. CH. MALLI KARJUNA\*1, B KRISHNAM  
RAJU\*2, SK MERAVALI\*3**

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**Abstract:** Transportation is one the need of human being, which is existing since the evolution of mankind. Earlier it was fulfilled by using animals, later by bus. Hence requirement of comfort is utmost required during transportation. Today, the field of air conditioning design is more technologically challenging than ever before. While design innovations and product improvements promise sleeker, more versatile, more powerful and more energy – efficient air conditioners, the challenge today lies identifying the most appropriate product, or mix of products, for the application at hand. Indeed, today the emphasis is no more on understanding air conditioning 'products' but on creating 'solutions' and not just solutions, but 'customized solutions' that suit specific cooling need of specific business and establishments. The consultant or designer who understands the dynamics of those clients' business is more likely to offer better long term cooling solutions than who does not. Every air conditioning application has its own special 'needs' and provided its own challenges. Airports, hotels, shopping malls, office complexes and banks need uniform comfort cooling in every corner of their sprawling spaces and activities involving computers, electronics, aircraft products, precision manufacturing, communication networks and operation in hospitals, in fact many areas of programming will come to a halt, so air conditioning is no longer a luxury but an essential part of modern living. In the present project the design of air conditioning is done for a Volvo bus, by

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**Abstract**—Cementitious materials are among the most commonly used and essential substances in the construction industry. While these materials are initially incorporated into well-established systems and fundamental designs during the construction process, their inherent fragility and susceptibility to cracking under stress necessitate ongoing maintenance or even replacement within a relatively short lifespan. To address this issue, there is a growing need for new concrete-based materials with improved durability characteristics, particularly in terms of crack resistance. Traditional concrete, being a brittle material, has been largely replaced by fiber-reinforced concrete due to its enhanced properties. While using a single type of fiber can have beneficial effects on the mechanical properties of concrete, hybridization offers the opportunity to combine different fiber types to leverage their respective advantages. In this study, the influence of incorporating both glass fiber and polypropylene fiber into concrete mixes is examined to evaluate the mechanical properties of the composite material. Fifteen cubes and fifteen cylinders of glass fiber-reinforced concrete (GFRC) at varying proportions (0.2%, 0.4%, 0.6%, 0.8%, 1.0%, 1.2% by volume of M30 grade concrete) were cast and tested for optimal compressive and tensile strength at 28 days. Additionally, three-dimensional specimens with different proportions of polypropylene fiber were cast, while maintaining the glass fiber content constant, to





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→ January 2023- Volume  
8 Issue 1 (5)

## DESIGN AND STRUCTURAL ANALYSIS OF AN AUTO-TILTING VEHICLE FOR AGRICULTURAL TERRAIN

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→ March 2023 (9)

**Abstract:** The use of a narrow / Auto tilting car instead of a large gasoline car should dramatically decrease traffic congestion and moving in agricultural terrain. This is the reason why more companies are producing narrow track electrical car prototypes. These narrow track cars have increased rolling tendency. The idea is to develop a tilting car of narrow track that seats two people tandem. This can be operated on reduced lanes thereby increasing the capacity of high. Narrow track cars are without doubt the future of urban mobility. This analysis is done by software. These cars have a very short wheel track in comparison to normal cars. Most international car companies have production models of narrow track cars. Such cars are mostly seated or double seater with back to back seating configuration. Recently there had been development in making three-wheeled tilting cars like the carver, but only design concept is the development in the concepts of four-wheeled tilters. In this project, I need to develop a tilting mechanism for a narrow track car to give it the flexibility of a motor cycle. This feature enables the car to tilt the curve while negotiating it. Analysis shows that to increase the maximum curve at speed. The calculations are enclosed within. The method we have used is a simple mechanical tilting system. A tilting mechanism if successful should dramatically increase the maximum speed in curves. This also provides the advantages of increased passenger comfort and handling. These systems are done using modeling software's like CatiaV5, and analysis is done by Ansys software.

→ December 2022-  
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### I- INTRODUCTION

Nowadays, automobile companies are involved in the design of more efficacious vehicles to improve energetic efficiency. To this end and in order to improve the traffic in the cities, the design of such vehicles with a better weight/load ratio is widely reported. Narrow track cars are without doubt the





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# STRUCTURAL DESIGN AND ANALYSIS OF PICK-AND-PLACE ROBOTICS COMPONENTS USING ANSYS SOFTWARE FOR AGRICULTURAL APPLICATIONS

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→ July 2023 (10)

**Abstract:** A system designed to record and report on discrete activities within a process is called a System. In the same procedure we have developed a methodology of robot direction system for robotic and achieve accurate direction for a class of non-linear systems in the presence of disturbances and variations by using wireless communication technique. In our project we track the robot by using communication i.e. from Control section (acts as transmitter) we are ejecting the control signals, the receives (acts as receiver) the signals, according to the signals it will change the direction in different project is designed is being designed by the modeling software like Catia V5; it is being done analysis Aluminum and steel material in Ansys or Hyper mesh Workbench. Around a Microcontroller which control unit of the project. According to this project, a transmitter is used to transmit the control signals controls the direction of the robot. In the same way, receiver is placed on the robot which receives according to which the direction of the robot is controlled. The microcontroller plays important role in the direction according to signals being received at the Receiver side in Robot section. This project finds places where one wants to control the direction of any automated device using wireless point communication.

→ October 2023 (10)

## I- INTRODUCTION

Automation or automatic control is the use of various control systems for operating 2022 (8) processes in factories, boilers and heat treating ovens, switching in telephone networks, steering and ships, aircraft and other applications with minimal or reduced human intervention. Some processes completely automated.

→ Volume 7 – Year 2022 (35)

A Pick and Place robot is a deployed for many purposes. The main area of application of Pick and Place designed to replace human labor. The industry is behind other complementary industries in using robots sort of jobs involved is not straightforward, and many repetitive tasks are not exactly the same every time cases, a lot of factors have to be considered (e.g., the size and color them to be picked) before the commence a task. Robots can be used for other horticultural tasks such as pruning, weeding, spraying and monitoring

The biggest benefit of automation is that it saves labor; however, it is also used to save energy and material improve quality, accuracy and precision. The term automation, inspired by the earlier word automatic (control)

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## ANALYSIS OF SOLAR-POWERED AIR CONDITIONING SYSTEM FOR COMMERCIAL BUILDINGS

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**Abstract:** A new system of solar air-conditioning, which adds the heat pump into the original solar air-conditioning, is proposed in order to improve the solar energy application grade. The new type of solar air-conditioning system will be analyzed and compared with the original system. Solar cooling is a good example of addressing climate changes. In this paper, we provide overviews for working principles of solar thermally operated cooling technologies and reviews for advancements of such technologies from the most recent publications. Researches of solar absorption cycles investigated new refrigerant absorbent pairs and various system configurations that could lead to increasing solar fraction and extending the cycle operation. Researches of solar adsorption cycles focused on the development and testing of various adsorbent refrigerant pairs, improving cycle components, and increasing the system efficiency. For the ejector cycles, many studies focused on using computer models and experimental works to investigate the performance of the ejector and find the key parameters affecting its operation.

### I- INTRODUCTION

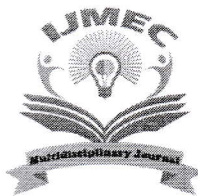
The energy needed to process and circulate air in buildings and rooms to control humidity, temperature, and cleanliness has increased significantly during the last decade especially in developing countries. This energy demand has been caused by the increment of thermal loads to fulfill occupant comfort demands, climate changes, and architectural trends. The growth of electricity demand has increased especially at peak loads hours due to high use of driven vapor compression refrigeration machines for air conditioning. In addition, the consumption of fossil fuels and the emissions of greenhouse gases associated with electricity generation lead to considerable environmental consequences and monetary costs.

Conventional energy resources will not be enough to meet the continuously increasing demand in the future. In this case, an alternative solution for this increasing demand of electrical power is solar radiation, available in most areas and representing an excellent supply of thermal energy from renewable energy resource.

One of the most common solar air conditioning alternatives is a solar powered absorption system. The solar absorption system is similar in certain aspect to the conventional vapor compression air conditioning system in that the electrical compressor; is replaced with a solar-powered generator and absorber. Figure shows a commercial flat-plate solar-powered single-effect absorption cooling system.

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## MONITORING ENVIRONMENTAL PARAMETERS AND DEVICE CONTROL VIA IOT (INTERNET OF THINGS)

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**Abstract:** This paper focuses on the functional design and implementation of a Wireless Sensor Network (WSN) platform tailored for long-term environmental monitoring within IoT applications. The platform's specifications take into account various application requirements such as low cost, high quality of service, extended lifespan, minimal maintenance, rapid deployment, and low power consumption. With notable transformations occurring in industrial process control, intelligent building management, and automation technologies, there is mounting pressure to reduce operational expenses while incorporating significant advancements in telecommunications and software. Software has emerged as a critical component in both production and enterprise-wide systems, while internet connectivity has revolutionized monitoring and control arrangements. Moreover, the utilization of open/public standards and personal computing devices (including PCs, tablets, and smartphones) offers substantial benefits to users and manufacturers alike. These developments have paved the way for a new Industrial Revolution, characterized by the integration of the Internet of Things (IoT) into industrial processes.

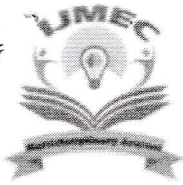
**Keywords.** Arduino, NodeMCU, Moisture Sensor, LDR Sensor, Lm35, LCD

### 1. INTRODUCTION

More than decade ago, the Internet of Things (IoT) was coined in which the computers were able to access data about the objects and environment without human interaction. Two technologies were considered as key enablers for IoT paradigm: Radio Frequency Identification (RFID) and the Wireless Sensor Network (WSN). While the former is well established for low cost identification and tracking, WSN bring IoT applications richer capabilities for both sensing and actuation. In fact, WSN solution already covers a broad range of research and technology advances continuously expand their application field Based on the advantages WSN concepts bring to a vast amount of different applications, interest in the corresponding technology is high. Ideally, the WSN allows for

the deployment of large amount of sensor nodes, which configure themselves, depending the network topology and neighborhood situation. After sensing the physical environment and processing the obtained data locally, nodes communicate their data towards a network sink, where data is further processed and made available for readout. As transmitted data should find the best route towards its destination automatically. A Environmental Monitoring Although EM can mean the monitoring of any kind of environment, it is most often defined as the observation and study of natural environment. Scientifically, EM includes the field the of physics, chemistry and biology. The motivation based on the ever increasing the world population, means that environmental monitoring is not limited to the understanding of environments, but also includes the monitoring





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**Abstract:** A Solar grass cutter is a machine that uses roller blades to cut a lawn at a faster rate. grass cutter can operate manually and motor driven. This is one of the most useful device in a field. consumption becomes essential for future. Solar grass cutter is a very useful device which is very simple in construction. It is used to maintain and upkeep lawns in gardens, schools, college's etc. Our aim is to analyze on the blade by using different materials like Steel and Iron for the grass cutter. Even an unskilled person can operate easily and maintain the lawn very fine and uniform look. In our project, a solar grass cutter is used to cut the different grasses for the different application. The solid model of the machine and blade is developed in Catia. Tetrahedral mesh is generated for the model using ANSYS. Static, Eigen and frequency responses analysis of both body and steel blades are carried out. Lamina shear stresses are calculated for composite propeller by varying the number of layers. This present thesis deals with modeling and analyzing the cutter blades of a grass cutter machine for strength. A propeller is a complex geometry which requires high end modeling software.

## I- INTRODUCTION

A Grass crusher provides for pulverization of Grass to a yield size of 2" or less. Recycling operation may range from simple, manually-fed, self-contained machines to extravagant cutting systems complete with screens, conveyors, crushers and separators. All non-Grass contaminants must generally be removed from the Grass prior to recycling. The processes used in Grass Cutting for recycling involves the methods used by the aggregate industry for Cutting into small pieces of Grass (Grass crusher).

Technology is changing people's labor patterns, in the same way, the Grass Cutting process is changing all the time. The traditional Grass Cutting production process has been far from meeting the requirements of the people. Only advanced new type Grass crusher and its intelligent process can meet the development of the industry.

Zambia is rapidly pushing on the national infrastructure, which not only needs a lot of building materials, but also needs a lot of Grass. As we all know, Grass used in Crushers Grinding Mills for various aspects of our lives, not only have the function of function, but also have decorative effect. After large scale urban infrastructure and demolition, the remaining Grass mostly becomes waste and occupies a large space, the most important thing is that it easily causes injury or death if we misplace the Grass. In addition, at the same time, we need a lot of Grass productions. So it is very important and urgent how do we can turn waste Grass into treasure, save resources and a lot of urban construction funds.

Most conventional Grass machines crush Grass only into cullet. The resulting cullet is used for making Grass again if it is transparent, and other cullet is mixed in secondary products, asphalt and blocks. Cullet, however, is low-value-added products, and its use in business is limited. On the other hand, the product produced by the Waste-Grass Recycling Plant, has a wide range of application, such as a light embankment material in civil engineering, a culture medium or an inorganic soil amendment in horticulture.



# SPROUT FRAMEWORK: ORCHESTRATING FARM AUTOMATION AND CLOUD INTEGRATION FOR ENHANCED AGRICULTURAL OPERATIONS

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**Abstract--** The SPROUT framework is a coordinated solution designed to address the pressing challenges faced by farmers in today's society. In countries like India, agriculture plays a vital role in food production and economic development. However, agriculture heavily relies on rainfall, which is often insufficient. Therefore, irrigation becomes essential for agricultural fields, with factors such as soil type, water availability, and moisture content influencing the irrigation system. This paper proposes an automatic irrigation system based on Internet of Things (IoT) technology. The model incorporates sensor-based monitoring to detect moisture levels and water sources across the field. By leveraging IoT sensors, the system can remotely control water pumps based on real-time data, optimizing irrigation efficiency. Presently, farmers encounter significant challenges in managing irrigation schedules, often relying on erratic power availability and manual labor. The proposed solution aims to alleviate these issues by automating irrigation processes. When power is available, the system automatically activates the water pump based on soil moisture levels, ensuring timely and efficient irrigation. Additionally, farmers receive SMS notifications regarding the farm's current status, including temperature, soil pH levels, and rainfall forecasts, accessible through a user-friendly web interface.

**Keywords—** *IoT, Sprout, Agriculture, Automation*

## I.

## II. INTRODUCTION

IoT is an incredible and wide idea advanced as of late with mechanical technology and today the web monsters like Google, Microsoft and so on emphatically backing and work for this new field. Man-made consciousness or computerizations are the honored gifts of this killing idea. Primary target of web of things is to associate web with our everyday utilizing things and to decrease human endeavors by the assistance of cloud and organizations.

The thought is to associate the horticulture area to the universe of web. India is a huge country with a much populace, over half of Indians are ranchers or relying upon horticultural areas and consistently we loses a great deal of ranchers on account of they tired of the field of cultivating and even they constrained to do suicides because of unexpected weather conditions changes and floods causes them a major misfortune.

The framework is absolutely eco-accommodating and delivers 0% waste. Alongside this it is associated with the Google climate API's thus it will likewise take care about water utilization and can water the plants by downpour expectation, on the off chance that it is a blustery day it won't water the plants, and at whatever point the moistness or the water content of the dirt decreases it gives the enough measure of water, or even pH esteem or the minerals of soil lessens it will illuminate the rancher or it is done consequently assuming the unrefined components are given. Before the weather conditions changes and weighty rains and floods, ranchers get ready and safety efforts.

SPROUT is the integrated system which execute several operation simultaneously to resolve the issues of farming, which are causing a huge trouble now a days in the society of farmers. In India, agriculture plays an important role for development of food production.

Agriculture depends on the monsoons which is not sufficient source of water. So the irrigation is used in agriculture field. In irrigation system depends upon the soil type, water availability, moisture content, etc. In this paper automatic irrigation system which is based on IoT setup. The model shows the basic switching system mechanism of water motor using sensors from any part of field by sensing the moisture, water source, etc.

In present days especially farmers are facing major problems in watering their agriculture fields, it's because they have no proper idea about when the power is available so that they can pump water. Even after then they need to wait until the field is properly watered, which makes them to stop doing other activities. Here is an idea which helps not only farmers even for watering the gardens also, which senses the soil moisture and switches the pump automatically why the power is 'ON'. Every



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# ADVANCEMENTS IN WIRELESS POWER TRANSMISSION TECHNOLOGY

BY IJMEC / DECEMBER 2022- VOLUME 7 ISSUE 12 / 0





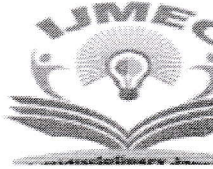
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# APPLICATION SUCCESS PREDICTION AND ANALYSIS TOOL

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→ April 2023 (9)

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Volume 7, Issue 12, December-2022, <http://ijmec.com/>, ISSN: 2456-4

→ August 2023 (6)

# SECURITY AND AUTOMATION APPLICATION FOR BUILDING AND FACTORIES

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A.M Reddy Memorial College of Engineering and Technology, December 2023  
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**Abstract :** The project proposes a practical application of IoT for monitoring and controlling financial transactions using the internet. The advanced automation framework involves devices as a user interface, capable of communicating with the digital automation network web interface, using low-power communication protocols such as Zigbee, Wi-Fi, etc. initiative aims to control commercial appliances through mobile phones using wi connectivity. Users can manage devices like lights, fans, and door locks through a simple interface over the internet. Additionally, in case of a fire hazard notification message image are sent to the user's phone. The system can be integrated with home automation ci to control the devices within the premises. Communication with the system enables use select and operate the desired devices efficiently. Moreover, the system addresses pot connectivity issues by allowing devices to function locally if the internet connection is do the central system is offline. Through this approach, we offer a scalable and cost-effective commercial automation solution.

→ May 2023 (15)

**Keywords :** Building Automation, Factory Automation, Smart Devices.

→ November 2023 (18)

## 1. INTRODUCTION

The significance of introducing a pleasantly unprecedented model wi-fi Sensor social (WSN) in business take a stab at programming can't be over-featured, as needs are experience tends to the great master in intersection the distance among the accessibility o after information offering all due appreciation to cultivate the current turns of events an standard methodology for endeavors. WSN is a progression wherein basically confined fo help each other in sending loads of information through the local vehicle to the spot for m unendingly. The WSN joins focuses that can send and get messages in a cross segment pla a middle that can fill in as a switch and can also hand-off messages for its neighbour. thu thusly, Wi-Fi group encounters will notice their course to the predetermined occasion spot, transitory focuses with reliable correspondence procedures. WSN programming sways from locale to another. different fields including fire, equipped power distribution, contamin machine success, and regular parts following fuse gifted creating unobscured insid execution of this time in checking sports incorporate them. In many preposterous areas, controlling is utilized because in reality the area, at the indistinct time as new flooding-l thoroughly time, offers the open door and advantages, especially in gigantic affiliations.

Principal



**Authors: Dr. D. Manikanta\*1, M. Mounika\*2**



**Abstract**—This study investigates the use of recycled materials in concrete manufacturing as a substitute for natural coarse aggregate to achieve the desired strength. It examines the mechanical and physical properties governing the strength of recycled coarse aggregate concrete compared to fresh concrete. The research employs various concrete specimens made with recycled aggregate and evaluates them against conventional concrete. The study also assesses the use of recycled aggregate in a consistent concrete mix of M20 with a fixed water-cement ratio. Two different ages of recycled aggregate are considered, with a 30-year age gap, and samples are compared to conventional cement. While few studies have explored the use of fine aggregates in this context, none have discouraged their use in construction. This project utilizes recycled aggregate in concrete and conducts laboratory-based experiments by crushing concrete specimens (cubes and prisms). A total of 21 cubes and 21 prisms are cast and tested for 28 days, with an additional 9 cubes and 9 prisms cast using different proportions of recycled coarse aggregate (30%, 60%, and 100%) for one age of recycled aggregate. Furthermore, 9 additional cubes and 9 prisms are cast using recycled aggregate from another age, along with virgin coarse aggregate. The remaining 3 cubes and 3 prisms are made using conventional M20 mix concrete. The study aims to reduce concrete waste, address ecological challenges, and mitigate the negative impact of natural coarse aggregate extraction. It focuses on recycling construction waste from demolished

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