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ICETEMS-2021

International Virtual Conference on

Emerging Trends in Engineering and Management Sciences

23rd - 24th July 2021

Organized By

Marathwada Mitra Mandal's College of Engineering (MMCOE)

Marathwada Mitra Mandal's Institute of Technology (MMIT)

Institute of Management Education Research and Training (IMERT)

In Association with

Institute For Engineering Research and Publication (IFERP)

ICETEMS – 2021

International Virtual Conference on "Emerging Trends in Engineering and Management Sciences"

Pune, India

23rd – 24th July, 2021

Organized by:

Marathwada Mitra Mandal's College of Engineering,
Marathwada Mitra Mandal's Institute of Technology,
Institute of Management Education Research & Training

In Association with:

Institute For Engineering Research and Publication

Rudra Bhanu Satpathy
Chief Executive Officer
Institute For Engineering Research and Publication.

On behalf of ***Institute For Engineering Research and Publications (IFERP)*** and in association with ***Marathwada Mitra Mandal's College of Engineering, Marathwada Mitra Mandal's Institute of Technology, Institute of Management Education Research & Training***. I am delighted to welcome all the delegates and participants around the globe to ***Marathwada Mitra Mandal's College of Engineering*** for the "***International Virtual Conference on "Emerging Trends in Engineering and Management Sciences" (ICETEMS-2021)"*** Which will take place from ***23rd - 24th July 2021***

It will be a great pleasure to join with Engineers, Research Scholars, academicians and students all around the globe. You are invited to be stimulated and enriched by the latest in engineering research and development while delving into presentations surrounding transformative advances provided by a variety of disciplines.

I congratulate the reviewing committee, coordinator **(IFERP & MMCOE)** and all the people involved for their efforts in organizing the event and successfully conducting the International Conference and wish all the delegates and participants a very pleasant stay at ***Pune, India.***

Sincerely,

Rudra Bhanu Satpathy

Preface

The ***International Virtual Conference on "Emerging Trends in Engineering and Management Sciences" (ICETEMS -21)*** is being organized by ***Marathwada Mitra Mandal's College of Engineering, Marathwada Mitra Mandal's Institute of Technology, Institute of Management Education Research & Training*** in Association with ***IFERP-Institute for Engineering Research and Publications*** *on the 23rd – 24th July, 2021*.

The **"*International Virtual Conference on "Emerging Trends in Engineering and Management Sciences"*** was a notable event which brings Academia, Researchers, Engineers, Industry experts and Students together.

The purpose of this conference is to discuss applications and development in area of **"Engineering and Management Sciences"** which were given International values by ***Institute for Engineering Research and Publication (IFERP).***

The International Conference attracted over 380 submissions. Through rigorous peer reviews 179 high quality papers were recommended by the Committee. The Conference aptly focuses on the tools and techniques for the developments on current technology.

We are indebted to the efforts of all the reviewers who undoubtedly have raised the quality of the proceedings. We are earnestly thankful to all the authors who have contributed their research works to the conference. We thank our Management for their wholehearted support and encouragement. We thank our Principal for his continuous guidance. We are also thankful for the cooperative advice from our advisory Chairs and Co-Chairs. We thank all the members of our local organizing Committee, National and International Advisory Committees.

ICETEMS -21

Message from the Principal, MMCOE

Dr. S. M. Deshpande

Principal, MMCOE, Pune

Greetings of the day & Warm Welcome to all the participants & organizing members of ICETEMS-2021 at MMCOE, Pune. I am very pleased by the overwhelming response received this year and look forward to your continuing patronage in successive years.

Friends, the current pandemic scenario has indeed shown us the vulnerability of humanity since past 2-years. Such a once-in-a-century crisis has proved to be tough challenge to all of us. It has truly put the resilience of humanity to extreme test.

But as the famous saying goes – Humanity always triumphs! Despite the enormous challenge, societal response has shown the alacrity in adaptation, glaring transformation from pre-pandemic days. And, yes Applied Science & Engineering Technology have indeed become saviors & shields for our survival and growth of our future civilization.

For instance, genome sequencing by AI software's has been heralded as an achievement in rapid test-kit deployment & vaccine development. Image processing / Machine learning technologies in healthcare reassured our breath monitoring & chest functionality. Telemedicine safeguarded and comforted our lives and those of our near-dear ones remotely & reliably. R&D in Material sciences facilitated materials that are COVID preventive & protective. Traditional industrial companies are embracing this paradigm shift to facilitate clean and green solutions.

Technology enabled process migration has indeed uplifted & shaped our life standards. Open source-based Co-Win App is a classic example of “Make-in-India” and “Made-for-the-World” that covers contact-tracing, home quarantine and vaccination passport. Its inspiration is drawn from the guiding maxim – More Humane for more humans!

I, therefore, urge you all to enrich and empower yourself through this conference that shall provide you a renewed focus in your research areas. With my best wishes, I announce the commencement of ICETEMS-2021. Thank you!

Regards,

Dr. S. M. Deshpande

Principal,

MMCOE, Karvenagar, Pune

Welcome message from the Convenor

Prof. Dr. Pramod S. Purandare

Convenor, ICETEMS 2021

Dear Dignitaries, professors, colleagues, researchers, ladies and gentlemen, on behalf of Marathwada Mitra Mandal College of Engineering (MMCOE), Marathwada Mitra Mandal Institute of Technology (MMIT) and Institute of Management Education and Research (IMERT), I would like to express my sincere gratitude and welcome you to the "International Conference on Emerging Trends in Engineering and Management sciences (ICETEMS 2021)."

I honourably welcome our keynote and invited speakers;

Prof. S. N. Kulkarni, Business Consultant, Dubai. Advisor, Honourable Minister of Tribal Affairs, Higher & Technical Education, Government of Nagaland, India and CEO, Professor Kulkarni's Solutions Ltd.

Professor Marwan Al-Akaidi, IEEE SPC Chair, IEEE UK & Republic of Ireland, Co-founder of the Eurosis, Vice president Research & Dean of the College of Computing & Information Technology, The American University in the Emirates (AUE), Dubai.

Prof. Dr. Dileep Kumar M, Director, Professor - NFCT, (MALAYSIA) & Pro-Vice Chancellor: Academic & Research, GNS University, India.

Sh. Pravin Mehta, Director General-Armaments & Combat Engineering System, DRDO MoD, Pune, India

It is my hope that the ICETEMS 2021 would be able to achieve its objective in providing an effective forum for academician, researchers, and practitioners to advancing knowledge, research, and technology for humanity. There has always been a gap

between peoples and communities who can make effective use of technology and those who cannot. For that matter, all academicians, researchers, and practitioners should consider technology to make a peaceful and meaningful world. With technology and management, we change to the better environment and a better life. No matter how much we can accomplish by ourselves, whether it be research or development, it is never sufficient in this world of knowledge. Therefore, the focal drive of this conference is to exchange ideas, and by participating in this exchange, it is hoped that all parties who may benefit from the conference can apply it in managing activities in their areas. It is pleasing to note that the streams of this conference cover a wide range of interesting topics related to all theoretical and practical aspects of Engineering, science and Management.

Last but not least, my deepest gratitude goes to the Advisory Board, Organizing Committee, International Scientific Committee, institutions, volunteer and IFERP coordinators, who have directly and indirectly supported the success of this conference. The committee has organized a vibrant scientific program and is working hard to present highly respected and internationally notorious speakers to lead it. May God bless us all with good health to make this event a successful and enjoyable one!

Best Regards,

Prof. Dr. Pramod S. Purandare

Convenor, ICETEMS 2021

ICETEMS -2021

International Virtual Conference on "Emerging Trends in Engineering and Management Sciences"

Keynote Speakers

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Advisor, Honourable Minister of Tribal Affairs, Higher & Technical Education Government of Nagaland, India
CEO, Professor Kulkarni's Solutions Ltd
Vice President, International Accreditation Organization (IAO) Houston, Tx, USA
Former –Vice Chancellor – APG Shimla University, Himachal Pradesh

Professor Marwan Al-Akaidi

IEEE SPC Chair
IEEE UK & Republic of Ireland
Co founder of the Eurosis
Vice president Research & Dean of the College of Computing & Information Technology
The American University in the Emirates (AUE), Dubai.

Prof. Dr. Dileep Kumar M

Director, Professor - NFCT, (MALAYSIA) & Pro-Vice Chancellor: Academic & Research
GNS University, India

Sh. Pravin Mehta

Director General-Armaments & Combat Engineering System
DRDO MoD, Pune, India

Prof. I Made Putrawan

Professor at Faculty of Psychology
University of Pancasila, Indonesia

ICETEMS -2021

International Virtual Conference on "Emerging Trends in Engineering and Management Sciences"

Pune, India, 23rd – 24th July, 2021

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ICETEMS -2021

International Virtual Conference on "Emerging Trends in Engineering and Management Sciences"

Pune, India

23rd – 24th July, 2021

ABSTRACTS

ICETEMS -2021

Organized by:

Marathwada Mitra Mandal's College of Engineering,
Marathwada Mitra Mandal's Institute of Technology,
Institute of Management Education Research & Training

In Association with

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Optimum Design and Analysis of Centrifugal Pump Impeller

NIHAL A. Mujavar, Department of Mechanical Engineering, Marathwada Mitra Mandal's Institute of Technology, Lohgaon, Pune
Prof. Eknath Kurhe, Department of Mechanical Engineering, Marathwada Mitra Mandal's Institute of Technology, Lohgaon, Pune
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Lakshman B. More, Department of Mechanical Engineering, Marathwada Mitra Mandal's Institute of Technology, Lohgaon, Pune
Vinay V. Pagar, Department of Mechanical Engineering, Marathwada Mitra Mandal's Institute of Technology, Lohgaon, Pune

Abstract:--

Centrifugal pump is very essential equipment and very useful for water pumping for domestic as well as agriculture purpose. Impeller is heart of centrifugal pump. This paper revolves around the concept of optimize and efficient design of centrifugal pump impeller using simulation software ANSYS and other suitable software. Performance parameter like head, rotational speed, pressure distribution, pump efficiency will compare by analysis.

Keywords:

Centrifugal pump, impeller, analysis, ANSYS.

Optimal Routing in IoT for Green Communication: A Survey on Sensors and Sensor Fundamentals with Diverse Meta-heuristic Algorithms and Fitness Functions

Umakant L Tupe, Research Scholar, Department of Computer Engineering,MMIT,Lohgaon,Pune
Dr.Sonali Kadam, Associate Professor, Bharati Vidyapith's College of Engineering for Women,Pune
Dr.Parikshit N Mahalle, HOD & Professor,Department of Computer Engineering, SKNCOE,Pune

Abstract:--

Nowadays, the research work on Internet of Things (IoT) increases owing to the less cost of framing them using the optimized sensors. Wireless sensor devices act as an important role in the IoT sensing infrastructure development. These devices are joined that forms a network called the Wireless Sensor Network (WSN) enabled IoT network. It also generates a vast energy requirement. Hence, effective energy usage is needed for changing the green IoT environment. The fast data transmission and the energy efficiency are important to the green communications-oriented applications for IoT. The sensors use a broad spectrum of signal transformation and transducer techniques with related changes in technical complexity. These vary from simple temperature measurement on the basis of a bimetallic thermocouple to the particular bacteria species detection with the help of optical systems. The main intent of this paper is to plan for accomplishing a detailed review on optimal routing schemes in WSN and IoT, which is highly suitable to build a green communication as well as the different types of sensors and sensing fundamental that is adaptable for the WSN. This review focuses on the diverse meta-heuristic algorithms developed for optimal routing and the derived fitness functions. In addition, the implemented tools and the performance metrics concentrated in each contribution are properly analysed. The types of sensors and its characteristics and the usage are clearly analysed. The fundamental objective of this research is to address the existing gaps of different meta-heuristic algorithms and its fitness functions for enhancing the network lifetime. The energy efficient parameters are analysed in terms of numbers. The systematic review addressing the challenges from 2010 to 2020 is done, thus ensuring the development of effective Green IoT by academic and research community via the illustrated research open challenges in routing and sensor.

Keywords

Green IoT communication; Optimal Routing; Sensor Fundamentals; Diverse Meta-heuristic Algorithms; Fitness Functions

Online FIR System

Vandana Rupnar, Assistant professor at MMCOE
Himanshu Dhakate, Pursuing Computer Engineering from MMCOE
Virupaksh Jadhav, Pursuing Computer Engineering from MMCOE
Vinit nandurkar, Pursuing Computer Engineering from MMCOE
Sagar Padwekar, Pursuing Computer Engineering from MMCOE

Abstract:--

The huge success of internet and information tech- nology have a remarkable effect on both public and private sectors within a country. The internet services and applications have drastically increased.But The Indian Police Department has ever since remained manually driven for most of its routine chores. The officials have been adopting the basic fundamental methods of carrying out the procedure with the traditional "pen and paper" method being highly prevalent. These traditional practices were comfortable in earlier days, when population was far less, and the crime rates were also comparably minimal.

But in today's India, when the evil elements of the society are in a boom and so many cases being registered every day, it is more convenient to use internet applications to give an online complain regarding any suspicious activity rather than visiting a police station. This method is reasonably secure since it is possible to hide the identity of the person who reported the complain about the crime. Many cases are not registered in police station since the person complained wants to hide the identity due to the possible risk or danger.

An online application can bridge this communication gap be- tween police and the individuals to send reports or other required information. This paper proposes an application that can be used by the individuals to report and manage their complains effectively. Further the system can be used by the people to register the complaints and is helpful to the police department in identifying the criminals, and tracking the complaints. The main purpose of the application is to improve the effectiveness and efficiency of interaction procedures between the police officials and common people.

Index Terms

FIR Tracking, Complaints, Crimes, Investiga- tions, etc.

IOT based smart homes for elderly healthcare

Aishwarya Bhagat, Marathwada Mitra Mandal's College of Engineering, Pune
Shirina Aalagi, Marathwada Mitra Mandal's College of Engineering, Pune
Snehal Gaikwad, Marathwada Mitra Mandal's College of Engineering, Pune

Abstract:--

In old age, the need for medical support is required, this leads to unplanned visits to the doctors frequently. Smart homes, integrate health and other ambient assisted living technologies, playing a lead role in revolutionizing the way in which healthcare services are being provided to the elderly. The objective of this work is to provide an affordable smart home system focusing on all the elderly people who need lifestyle/health monitoring in real time. A notification message is sent to elderly person's relative and doctor in emergency situations. The system is made user friendly taking into consideration the daily needs of the elderly.

Index Terms

Notification, Smart Home System, Raspberry Pi.

Use of Smartwatch for Presymptomatic Detection of Covid

Mugdha Gokhale, Affiliated by Marathwada Mitra Mandal College of Engineering,Pune
Gouri Bodade, Affiliated by Marathwada Mitra Mandal College of Engineering,Pune
Sudheer Bazaz, Affiliated by Marathwada Mitra Mandal College of Engineering,Pune
Manisha A. Dudhedi, Affiliated by Marathwada Mitra Mandal College of Engineering,Pune

Abstract:--

A smart watch is a unique and small portable device which helps user to carry it anywhere. In this time of corona pandemic, taking care of health is important, so this smart watch will monitor person's health parameters. Now the smart watch have all types of sensors to keep ourselves in check and to ease our way of living. The motive behind smartwatch is to indicate symptoms of Corona. Once the symptoms are detected the notification will pop up on the device-smart watch. This device is Arduino based with different biomedical sensors interfaced for measuring various biomedical parameters like body temperature, pulse rate and oxygen level. The other features in the device are Bluetooth and WiFi modules for maintaining social distancing. The smart watch designed has some key factors that make it different than watches available in the market with respect to healthcare. This device helps us maintaining social distancing as well as monitors our health.

Index Terms

COVID-19, Healthcare, Smartwatch, Social distancing.

Design and Development of Smart Battery Charger for EVs using single phase Vienna Rectifier

Aadesh Aslekar, Marathwada Mitra Mandal's College of Engineering
Atharv Belsare, Marathwada Mitra Mandal's College of Engineering
Sudhanshu Baraskar, Marathwada Mitra Mandal's College of Engineering
Dr. Anagha Kunte, Marathwada Mitra Mandal's College of Engineering

Abstract:--

With advancement in technologies, it is suggested that electricity is the most suitable energy carrier for transportation. For this to happen we need powerful battery charging stations. In this project we have proposed a level-2 on-board plug-in battery charger which operates in fast charging mode (up to 4-6hrs), and will notify the charging status to the user, over the Wi-Fi. This paper presents design and implementation of a Single-Phase Vienna rectifier as Power Factor Correction circuit to improve the overall efficiency of the charger. Smart features include monitoring the cells in the battery to make sure that they function properly and notify the user of the issue, if any, in the battery pack. It also indicates possible failures that may occur in the battery pack. Different types of batteries can be charged as per the required voltage and current levels to ensure longevity of battery life. The implemented charger can work at 180-250VAC and can supply up to 20 Amperes of current, depending on battery charging specifications.

Index Terms

E-Rickshaw, Power Factor Correction, Single Phase Vienna Rectifier, Smart Charger

Multitasker Agri-Bot

Akash Mahajan, Marathwada Mitra Mandal's college of Eng Karvenagar
Onkar Jagdale, Marathwada Mitra Mandal's college of Eng Karvenagar
Pooja Wadghule, Marathwada Mitra Mandal's college of Eng Karvenagar
Dr. Anagha Kunte, Marathwada Mitra Mandal's college of Eng Karvenagar.

Abstract:--

Agriculture has been the backbone of the Indian economy and it will continue to remain so. However, timely farming operations such as seed sowing, harrowing, pesticide spraying, and measuring the moisture have become very important to get a good yield. Hence, nowadays, with the advances in robotic technology, it can serve as a very useful tool. With the advantages of robots such as hands-free and fast data input operations, Multitasker Agri-bot is designed in a way so that it can perform all the major agriculture operations, remotely. It is an electromechanical vehicle that is steered by hub motors to drive wheels, the farm is cultivated by an automated system, depending on the crop considering rows and specific columns. The bot is controlled remotely by using a smartphone. There is a plant health monitoring system that uses a web camera to detect any disease of a plant. Sensors present in the system can gather data from its environment, based on which it takes the right decisions, then send commands to other parts to take action. In this, a robot is controlled by Node MCU and Raspberry Pi. Power to the bot is given by 48v LiFepo4 and power to various functions of the bot and electronics component is provided by 12v LiFepo4. 7inch display screen shows data and sends the command to control some actuators. The bot is designed using CATIA software and node-red is used to create GUI (Graphical User Interference). Multitasker Agri-bot has a run time of 6 hours resulting in better efficiency and productivity.

Index Terms

Electromechanical vehicle, LCD display, Plant health monitoring, Remotely operated

Design and Development of Dual-Polarized Orthogonal Cross Yagi antenna for the frequency range of 50MHz to 500MHz

Madhura Barshikar, Marathwada Mitra Mandal's College of Engineering
Abhishek Yenpure, Marathwada Mitra Mandal's College of Engineering
Om Atre, Marathwada Mitra Mandal's College of Engineering
Swarali Jagdale, Marathwada Mitra Mandal's College of Engineering
Avantika Iyengar, Marathwada Mitra Mandal's College of Engineering
Tejas Rampurkar, Marathwada Mitra Mandal's College of Engineering
Dr. Anagha Kunte, Marathwada Mitra Mandal's College of Engineering

Abstract:--

A dual-polarized orthogonal cross Yagi-Uda antenna with the end-fire transmission is designed, for astronomical observations, radio communication, and many more, in the frequency spectrum of 50MHz to 500MHz. Due to cross yagi directors, maximum directivity and linear polarity (vertical and horizontal) is achieved. Using much different software like Matlab, MMANA and CST Studio, all the parameters and plots are simulated. This antenna has a versatile design, ideal to make a wide array network to receive radio signals. For dual-polarity, the reflector at the back gives a balloon-shaped radiation pattern. The whole design fits within the one m^2. The peculiarity of the antenna is that it is portable, thus, convenient to set up. A lightweight tripod is designed with ABS+Aluminium alloy to handle wind resistance. This material makes the antenna cost-effective. A motorized mount of Altitude-Azimuth is mounted on the tripod also the antenna achieved an overall gain of around 12dB.

Index Terms

Yagi-Uda, Matlab, MMANA, CST, Tripod, Altitude-Azimuth mount.

Design and Development of Low Cost and Miniature Sun sensor for CubeSat

Madhura Barshikar, Marathwada Mitra Mandal's College of Engineering
Abhijeet Gotad, Marathwada Mitra Mandal's College of Engineering
Dr Anagha Kunte, Marathwada Mitra Mandal's College of Engineering

Abstract:--

CubeSat's demand has exponentially developed in the last several decades for space research. In today's world, the entire communication, navigation, disaster management and weather forecasting is feasible because of the vast development in the space sector. The primary concern for the satellites orbiting in Low Earth Orbit (LEO) with a velocity of 25000 km/hr is stability; thus, Attitude Determination and Control Subsystems (ADCS) has implemented. A small-sized compact sun sensor is a part of ADCS which is designed and developed, having a significant role in 3 axes pointing accuracy and stability for payloads and antennas in microgravity. Sun sensor takes photons as the input from the outer space, processes the data by estimating the angular difference and gives the output to the actuators, thus has a significance in determining the orientation of a satellite in space. The designed sun sensor can withstand the temperature from -40 to 80°C. It has a total weight of 125 grams and a Field Of View (FOV) of ±40°. The sensor is designed using microcontroller STM32 and simulated using STM32CubeIDE and Proteus and SolidWorks software. Newly developed Sun Sensor can cover 160° spanning coverage as designed with high reliability. The designed Sun sensonis used for Sun navigation in Target Satellite (T-Sat).

Index Terms

ADCS , CubeSat, Sun sensor, Low Earth Orbit, T-Sat

Automation of Drawbridge Model Using Raspberry Pi

Vaishnavi Bhortakke, Affiliated by Marathwada Mitra Mandal College of Engineering,Pune
Rohini Chintawar, Affiliated by Marathwada Mitra Mandal College of Engineering,Pune
Ayush Gole, Affiliated by Marathwada Mitra Mandal College of Engineering,Pune
Swati Deshmukh, Affiliated by Marathwada Mitra Mandal College of Engineering,Pune

Abstract:--

In this fast and materialized world, automation is a necessity as it provides flexibility, ease of operation, and operational safety. This paper presents automation on controlling the movement of a drawbridge and detection of ships using the video surveillance for ports thereby replacing the manual system which is currently used. Also, the status of the bridge will be uploaded on Cloud. This paper can be divided into three sections; vessel detection, operation of the bridge, and uploadation of data on the cloud. Picamera is used to monitor the arrival and leaving of the ships. For detection, Opencv and Python are used. Raspberry Pi is used to mechanize the whole system. For the operation of a bridge, a servo motor is used as an actuator and a driver circuit is used to control it. PIR Sensor and LED are used to provide input to the system and the servo motor serves as an output. Python is used as a programming language to control the whole system between input and output.

Index Terms

Raspberry Pi, Vessel Detection, Cloud, Opencv

Smart Plant Disease Detection

Tanvi Pandit, Marathwada Mitra Mandal's College of Engineering
Neha Thombare, Marathwada Mitra Mandal's College of Engineering
Rajiya Kazi, Marathwada Mitra Mandal's College of Engineering
Prof. Mrinalini Pangaonkar, Marathwada Mitra Mandal's College of Engineering

Abstract:--

It is not always possible for the farmers to predict the situation that can arise and their prediction can fail. The main reason is plant disease. So, to assist the farmers in safeguarding the plants from diseases becomes the motivation. Leaf images are vital in the automatic diagnosis of plant diseases, according to the majority of researchers. There has been development in technology used in automatic plant disease detection such as Deep Learning, Machine Learning, Computer Vision, Internet of Things (IoT), Expert Systems. The purpose of this system is to detect leaf disease using the machine learning technique based on Raspberry Pi controller for processing the plant leaf image to detect diseases.

Index Terms-

Machine Learning, Leaf Disease Detection, IoT, Raspberry Pi.

ECG Monitoring and Analysis using Machine Learning

Shardul Aryamane, Marathwada Mitra Mandal College of Engineering
Atharva Kurlekar, Marathwada Mitra Mandal College of Engineering
Jitendra Bakliwal, Marathwada Mitra Mandal College of Engineering

Abstract:--

Nowadays, people prefer staying home due to the pandemic situation. This system will help reduce contact between patient and doctor and reduce efforts by saving time as it will send the patient's recorded data to the doctor's database. Doctors can access this real-time database through cloud. This system will analyze whether the patient has Sinus Tachycardia or Sinus Bradycardia using Machine Learning. Sinus Tachycardia (also colloquially known as Sinus Tach or Sinus Tachy) is an amplified sinus rhythm depicted by an increase in the rate of electrical impulses arising from the sinoatrial node. In adults, sinus tachycardia is defined as a heart rate greater than 100 Beats/min (Bpm). Sinus Bradycardia is a slow, regular heartbeat. It happens when the heart's pacemaker, the Sinus node, produces heart beats less than 60 times in a minute. In few cases, such as healthy young adults and athletes, Sinus Bradycardia can be normal and a sign of Cardio-vascular health.

Henceforth, this system will be beneficial for adults and aged patients who are suffering from Cardio-vascular diseases as the patients will not have to visit the doctor's clinic or hospital very often.

Index Terms

AD8232 sensor, MCP3008 ADC, Raspberry, sinus tachycardia sinus bradycardia

Smart Shopping Trolley with Automatic Billing System Using Microcontroller

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Rachita Kadam, Dept. of E&TC, Marathwada Mitra Mandal'S College of Engineering, Pune.
Anisha Tambe, Dept. of E&TC, Marathwada Mitra Mandal'S College of Engineering, Pune.
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Abstract:--

Modern electronic technology relies on embedded system. The foremost aim of growing technology is to make life easier. Nowadays, shopping mall can be an area where people get their daily needs. But these present situations in shopping malls and supermarkets are, time consuming and it is a huge problem at charge section.

Sometimes, shopping is completed on the so much aspect on the budget of the customer. So, we are working on new generality that is "Smart looking shopping trolley with Automatic Billing System using Microcontroller". The system's aim would be consumer convenience and associate overall time efficiency and high performance. This goal is also achieved by the Wi-Fi system implemented QR Code technology. In this system we are using QR Code pattern on the products or items. Whenever the customer puts a product into tramcar or shopping trolley, it will get scanned by ESP Cam and additionally the product name and worth will be show on display (LCD). We are using technology in this way, where it will transfer the data to the computer and microcontroller and it will store the information about product value and total bill occur. 16x2 LCD shows that is ready to display product names, product worth etc.

Key Words:

Node MCU, Trolley (Tramcar), ESP 32 Cam, Load Cell, Buzzer, LCD Display.

Contactless Door Unlock System

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Jitendra Bakliwal, Marathwada Mitra Mandal's College of Engineering, Pune

Abstract:--

By using internet of things(IoT),Digital image processing and smartphones, the proposed system provides an automatic system to control and secure home. The proposed system consists of three major modules namely the IoT based hardware components, the Server and the Mobile application. Image of person is captured by Camera interfaced to Raspberry Pi. The captured image is then processed by using Python. A notification is pop-up on Mobile app whenever camera captures image whether he is known or unknown. This allow user to accept or reject person on door.

Index Terms

Io, Digital image processing, Raspberry Pi, Ultrasonic sensor, Server

Warehouse Inventory Management through Autonomous Drones using WhyCon Marker Localization System

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Sameeran Chandorkar, Marathwada Mitra Mandal's College of Engineering, Pune
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Abstract:--

In large warehouses, when conducting an inventory check or stock check, staff members are generally lifted up to high shelves utilizing a forklift, a truck, or scissor lift where they physically reach and examine/scan each standardized packet/item or box. This process is tedious, expensive, risky, and energy ineffective. To overcome this problem, we propose an autonomous drone- based technology using WhyCon Marker Localization System. Autonomous drones can navigate in storage areas very efficiently. They can scan and localize a maximum number of items/boxes on the go while sending live feedback of the stock inventory to the base station without any manual control. Generally, for autonomous drones, GPS based navigation system is used, but considering indoor warehouses GPS technology gives less accuracy for navigation. To counter this problem, we have used WhyCon Marker Localization System which uses a marker on a drone and an overhead camera to track the marker which in turn tracks the drone. This method is relatively inexpensive, can be implemented on lightweight drones, and gives high navigation accuracy in GPS denied environments as compared to other methods like SLAM, GPS, etc. For simulation and analysis, we have chosen an environment based on the Robot Operating System (ROS) and Gazebo simulator.

Index Terms

Warehouse Inventory Management, WhyCon Marker Localization, Autonomous Drones, ROS, Robotics.

Predictive Travel Chatbot Using Echo Platform

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Abstract:--

Intelligent Virtual Assistant (IVAs) has opened up another existence where you can ask an inquiry to machine as though it's a human and socialize it to play out specific errands as a rule. It can give better client driven suggestions. Chatbots give the help or admittance to data rapidly and proficiently. Thus, the chatbot is turning into an indispensable piece of things to come in purchaser administration or any movement administrations. On the off chance that an explorer is utilizing some other applications for direction or for arranging, this can include a huge space on client's gadget. This framework is a usage of a shrewd chatbot framework in travel area on Echo stage which would assemble client inclinations and model aggregate client information base and make suggestions utilizing the Restricted Boltzmann Machine (RBM) with Collaborative Filtering, likewise having various languages uphold. By using Machine learning algorithm, the past selection of the user will be used to train the application to recommend more relevant options as per user's liking. As the bot gets more choices from the user the recommendations will keep on improving by using DNN (deep neural network) engine. With this chatbot, we can improve human to machine communication in the travel space. Because of the ascent of Internet use, numerous organizations presently utilize online stages to deal with client requests, and a large number of them go to chatbots for improving their client care or for smoothing out activities and expanding their profitability. Be that as it may, there is yet a hole between existing chatbots and the self-ruling conversational specialists. Our travel bot centers around creating human-like chatbots fit for shutting this mechanical hole.

Keywords

Chatbot, DNN (Deep Neural Network), Restricted Boltzmann Machine (RBM), Amazon Alexa Echo platform, Natural Language Processing (NLP), Machine Learning (ML), Neural Network (NN).

Detection of Synchronization Failure by Using Frequency and Voltage and Using IOT

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Abstract:--

This paper gives the concept of IOT based automatic synchronization of alternators to grid. In 'modern power system' power from the generating station is delivered to the consumers through a large network of transmission and distribution. There are several power generation units which supply power to the load.

For satisfactory operation of load, consumers need constant voltage and frequency. To watch voltage and frequency a unit is developed. The essential idea is to implement the employment of up- to-date technology in sensing the very low variations in frequency or voltage magnitude of generators in grid. Consisting of terms "Frequency, Voltage, Phase Sequence and Phase Difference."

In today's practical world the ability Grid works to take care of stability and proper 'Synchronism', the detection and isolation of sources breach of synchronism, is of crucial significance as otherwise it'd have caused the whole system to fail.

Keyword

synchronization failure, IoT, voltage.

Electric Bike

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Aditya Vittal Mene, Marathwada Mitra Mandal College of Engineering, Pune, India.
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Abstract:--

An Electric vehicle (EV) are basically vehicle driven by electric motor or we can say traction motors in this case. The prime moto of selecting this project was to design a highly adaptable user-friendly E bike whose cost will be economically minimum. In 21st century, Electric vehicle (EV) is a centre of attraction in industry, electric vehicles won great attention from researchers. With the development of high-storage battery and EV, the paper briefly Introduce some aspect of EV, including studies on the charging methods, key techniques, impact of charging and solutions to the related issues. The aim of this study is to investigate how to design a simple, cost effective model of electrical motorcycle with internal combustion engine. The exhaust system and other unnecessary components from the motorcycle and replaced by an electrical motor an intelligent controller, a battery pack, cabling system and monitoring instruments, basically electric vehicle or we can say battery operated vehicles replaced IC engine by electric motors which draws power from batteries, which are rechargeable. Electric vehicle has number of advantages over conventional internal combustion engines in term of lower local emission higher energy efficiency decrease dependency upon oil, reduce global warming, emission of carbon in atmosphere. pure electric vehicles are more popular in current automotive market and they are free from pollution.

Keywords:

BLDC Motor, Battery, Controller, BMS display, Throttle

Design &Analysis of Helical Coil Heat Exchanger

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Abstract:--

Heat exchanger are important engineering system with wide variety of application including power plants, refrigeration and air conditioning system, heat recovery system, nuclear reactors, chemical processing and food industries Working towards the goal of saving energies and to make concise design for mechanical and chemical devices and plants, heat transfer play major role in design of heat exchangers. In this research its aims to perform a numerical study of helical coil Shell heat exchanger with water as both hot and cold fluid. To improve the effectiveness, D/d geometrical parameter will be varied for different boundary conditions. The impact of this modification on Cold water temperature, Hot water temperature, Cold water velocity, Hot water velocity, Reynolds number, with respect to D/d will also be studied.

Index Terms

helical coil heat exchanger, Heat transfer, Nusselt number, LMTD, Reynolds number.

Design & Manufacturing of Robotic arm for spray-painting application with 5 DOF

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Abstract:--

This report will give us a brief information about a robotic arm with 5 DOF, in order to deal with this report first of all let us know what a robotic arm is ? A robotic arm is an artificial arm to achieve desired tasks. Now a day, there is a more and more purpose to develop artificial arms for various non-human situations where human communication is impossible. Human's pickups stuff without considering the steps involved, and using wired and wireless, robotic arm is controlled manually. This paper focuses on design, and to control the robotic arm's angle by using Cortex ARM M3 LPC1768 Microcontroller including ultrasonic sensor and a digital controller using computer system. [9].

The robotic arm can move freely having 5 Degrees of Freedom (DOF) with a Servo motor situated at each joint. The function of Servo motor is position-controlling using a microcontroller. With the help of this Servo motor, Robotic Arm can position the link that required at the particular angle. By using rotary-encoder the feedback of the angle can be measured. The purpose of this paper is to introduce the level of intelligence that can be implemented to industries in order to reduce the human errors as well as enhance the quality and rapid production in manufacturing and processing. The major advantage of the Robotic Arm is that it can work in hazardous circumstances such as high temperature, pressure which is not suitable for the humans. The Robotic Arms can be update and modify easily. Robotic Arm reduces the overall cost and risk associated with the injuries of workers. The operation of designed robotic arm has been experimentally verified. [9]

Index Terms

Robotic Arm, servo motors, Spray-Painting

Automatic Waste Segregator

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Abstract:--

Rapid increase in population has led to improper waste management in metro cities and urban areas which has resulted in spreading of diseases. It is estimated that 2.02 billion tones of municipal solid waste was generated universally in 2006. The segregation, transport, handling and disposal of waste must be managed properly to minimize the risks to the public, and the environment. An efficient method to dispose the waste has been designed in our project, "automatic waste segregator". This project proposes an automatic waste segregator (AWS) which is a cheap, easy to use solution for a segregation system at households, so that the wastes can be sent directly for processing.[3]

When the waste is segregated at the primary level, the economic value will be realized at its best. Segregation of waste at dump yards is time consuming that makes recycling ineffectual. Currently there are very few but expensive systems for segregation of waste at the household level. This project proposes the design and development of an Automated Waste Segregator for household level which is cheaper and easy to use than the current technologies. Automatic waste segregator is designed to sort the waste into three main categories namely; metallic,dry and wet. The waste segregation is designed to segregate waste explicitly in step by step process using ESP 32 as the controller. This project is designed using IR sensor, inductive proximity sensor and moisture sensor to classify and separate metallic waste, dry waste and wet waste and it can also monitor the levels of bins using IOT-ThingSpeak

Index Terms

Waste management, Segregation, recycling.

Automized Surface Pristine Machine

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Abstract:--

In today's era, due to this automation and digital working environment the use of machines in regular activities are increased highly. Floor cleaning is time consuming and most tedious work as it is done manually. In order to reduce manual cleaning work, automatic floor cleaning machines are design. The machines are not yet popular because of its high price , operating cost etc. Due to this, most of small industries are still using bucket and mope system for cleaning. So, main aim of this research work is to design a automized surface pristine machine which will work automatically and will be cost effective also. By keepnig the cost criteria in concern, the machine is to be design.

Index Terms

Automatic cleaning machine, surface cleaner,vacuum cleaning, floor clean and mope.

Study on Velocity Parameter for roll forming Process

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Abstract:--

The roll forming process works by passing sheet metal through a series of rollers, with each of these rollers adding shape to the metal. The rolls work together to form the desired cross section. Since the process is consistent and easy to repeat, roll forming provides a great way to precisely produce very high volumes of metal components. Experimental and numerical methods are studied in this paper.

Index Terms

Roll forming, Longitudinal strain, residual stress, Spring back effect, FEA

Design and Fabrication of Sugarcane Cutting Machine

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Abstract:--

India is an agricultural country, In which 70% people are farmers. As, the population of India is growing, the demand of food is also increasing. In the present, required to produce more sugar per unit area, time and input in order to keep pace with the population growth while preserving the soil and water resources.Therefore, we should try to bring more land under cultivation. A sugarcane cutting machine is a piece of agricultural machinery used to harvest and partially process sugarcane.Under these circumstances, we are in need of fast cutting process instead of traditional cutting methods. In past, agri-related activities were taken care by means of manual force. But now a days in most parts of our country there is scarity of labours; hence labours are not available when required. So the labour cost is increased as for cutting of sugarcanes only skilled labours are required. By adopting the appropriate mechanical alternatives not only increasing the productivity but also cost efficiency in sugarcane production system. To minimize the labour cost and to get work done in minimum, time at cheap cost we have designed "SUGARCANE CUTTER'. It is simple in construction. It does not need skilled labour, reducing human drudgery and improving overall production efficiency.

Solar Powered Hybrid Vehicle

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Abstract:--

the fossil fuel such as petrol and diesel are very expensive way to be extracted and used. The use of fossil fuel based vehicles is one of the major reasons that has accelerated the extraction of these non-renewable resources in an unsustainable way. Further, transportation of these fuel to rural areas itself has become a problem. The major problem is greenhouse effect caused due to this burning of fossil fuel where large amount of CO2 will be emitted which causes lots of problem. Solar vehicles depend on PV cells to convert sunlight into electricity to drive the PMDC motors. Unlike solar thermal energy which converts solar energy to heat, PV cells directly convert sunlight into electricity. According to recent surveys the fossil fuels are depleting at a fast rate where in and around 50 years the whole fossil fuel in the world must be completely depleted. Therefore it is the need of the time to make a new exploration of natural resources of energy and power among the natural resources available sunlight is the most promising one. Sunlight is considered to be a source of energy which is implemented in various day to day applications.

Index Terms

Hybrid Vehicles, Electrical Vehicle, PV Cells

IoT Based Home Automation System

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Abstract:--

Home Automation system is one of the important needs of today's era. It consists of a smart lighting system, load Diversity system and, safety features. This is microcontroller- based technology used for two-way communication in safety features, sensor feedback in a smart lighting system. This home automation system is crucial as the consumption of electrical energy will reduce. This is IOT based project consist of sensors, timer circuits, and other electrical equipment. The circuitry is controllable utilizing inputs given by the sensors and the expected output action is taken by using microcontroller NodeMCU. This NodeMCU is a multitasking microcontroller use to perform various tasks. As it is IOT based we can operate it through mobile and other communication devices this is the main advantage of the system. For that purpose, we are using cloud service provided by Ubidots. The demand for automation in all the field is increasing day by day and home automation has a huge scope in the future.

Keywords

Home automation; IoT; NodeMCU; ESP8266 microcontroller; Cloud platform.

Design, analysis and validation of Aluminum disc brake

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Abstract:--

Disk brakes are widely used nowadays in automotive applications like cars, two wheelers, electric bikes etc it is used to stop the vehicle efficiently when pressure is applied on the disk, due to pressure there is friction generated which leads to heat generation and this heat is further dissipated to the surrounding , therefore this calls for a very precise design and selection of materials , the selection of the material is very crucial to reduce any mishap to the disk and most importantly the person operating it, for this purpose we have selected aluminum as it is light weight easy to machine and availability is also high, the specifications like heat flux, stopping distance , temperature were calculated , all the calculations were performed on Ansys and finite element analysis and reports were generated, further the prototype will be made and validation of the same will be done practically.

Human Eye Controlled Mouse using MTCNN and Dlib

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Abstract:--

In this digital era, there is the scope of development and advancement in the field of Image Processing. Hands free computing is in demand as of today it addresses the needs of paraplegic. For amputees or those people who have problems with their hands, this project presents a system for them through that they will be able to interact with computer. The system is an eye, fixed nose-based and mouth-based interface that acts as a mouse to translate movements like winking, starring and squinting towards the mouse cursor actions. Hardware requirement for this system is just a simple webcam and software requirement are Python (3.6), OpenCV, NumPy and a few other packages which are necessary for face recognition. This system can be built with the help of MTCNN which is used for detection of face, eyes detection and mouth detection and Dlib uses predictor and detector for the facial movements. There is no specific hand movement required and no external hardware or sensors are required.

Punching and Blanking Machine with Effective Cam Mechanism

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Abstract:--

The concept in this paper deals with design and fabrication of punching and blanking machine with use of effective cam mechanism using proper gears and pulley arrangement. Designing of this cam and follower mechanism is very complex, but it improves load distribution effectively and use of precise blanking punch die helps in seamless operation. These punching and blanking setup designed to punch medium thickness sheet metal components.

Punching Machine is one of the principle machines in paper cutting industry & sheet metal industry. It is mainly used as the name indicates to cut strips. So we have made a machine and made it multipurpose & should be used to cut the card board , asbestos sheets, papers, foam, thin plastic sheets, footwear's by changing tool as per requirement. The machine is simple to maintain, easy to operate

In many industries various types of machines and equipment have been used for various operations such as forging, hammering, cutting etc. But different problems such as low power supply, less man power and also heavy laborious work force, safety etc. This projects relates to operation performed by this can be achieved by either using electric motor power or by manually by means of simply rotating a hand lever attached to the shaft and hammering action can be provided. If there is good power supply it can be run automatically. For automatic operation A.C.

Motor is provided. Chain drive, belt drive, governor are also provided for speed control purposes so that the suitable speed can be achieved

Key words

Punching & blanking; Sheet Metal

Static Analysis of Connecting Rod

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Abstract:--

A Connecting rod is an important part of I.C. engine which provide link between piston and crankshaft to convert linear motion of the piston to the rotary motion of the crankshaft. Till now, vast research is going on in the field of metallurgy and resulted in large number of newly developed materials are available to select materials for particular applications. On this issue, in this study the connecting rod modulates and simulated for the static analysis by using CATIA software for modeling-design of connecting rod and ANSYS 14.0 for analysis. Using available high strengthen alloy is used for the connecting rod of Bajaj pulsar 150cc for the weight reduction helps to reduce moment of inertia. Static analysis is carried out for determine the Von misses stress, strain, and total deformation is calculated under loading conditions of compression and tension at crank end and pin end of connecting rod

Keywords:

Static analysis, Finite element modeling, Connecting rod, weight reduction, ANSYS.

Automatic Pipe Painting Machine

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Abstract:--

Painting is necessity for protecting the different surfaces not only metal but other surfaces also which is important for any kind of things but we specifically talk about the pipes because our project is related to that pipes are very important thing which enclosed container which used for congaing and traveling the fluids sometimes there are different types of fluids which can be react with different metals or non-metals and pipes are both are presents metals or non-metals and that type of reactive fluids can be affect the pipe and sometimes they damage it. For that remedy we paint pipes not only outside but inside also which protect from chemical reactions and damages of pipe.

In specific internal coating or painting of pipe is difficult for worker because of uncomfortable position during painting the inside of pipe, and it also increase the fatigue of worker, and at the end of result there is waste of time, money and manpower, that's why automation in this internal pipe painting is necessity, so for that we design the machine to appropriate that work.

Our aim is to automation in this field for increase the speed of work and reduce the man power and working time, Also in hazardous painting operation is done by without any man contact to prevent life threats.

Index Terms—

Automatic Pipe Painting, Frame, Spring, Shaft, Static Analysis of Frame with Shaft.

Design of 360˚ Air Cooler

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Abstract:--

Evaporative cooling is the process by which the temperature of a substance is reduced due to the cooling effect from the evaporation of water. The conversion of sensible heat to latent heat causes a decrease in the ambient temperature as water evaporated provide useful cooling. This cooling effect has been used on various scales from small space cooling to large industrial applications. Air coolers are one of the most prominent applications of the above working principle. With time, coolers have proved to be of the utmost importance in human comfort in terms of cooling and conditioning of air. Air coolers intakes the hot and dry atmospheric air and lowers the temperature and increases the humidity of air by using latent heat of evaporation, changing liquid water to water vapor, providing cooled air at the output. In this process, the energy in the air does not change. Warm dry air is changed to cool moist air. Air coolers are used in summer seasons or in the regions with hot and dry air conditions like deserts, large halls, storage units etc.In the case of standard air cooler, cooled air is available only at one face of the cooler. Hence, to get a wider reach at the output, adjusting panels were used to allow the flow of cooled air in different directions. Still, it didn't manage to cover the unexposed area around it. Due to which further modifications were expected in this device. "360˚ Air cooler" is an innovative modification of a traditional air cooler which is used to overcome the problem faced in the standard air coolers, that is, maximum reach and circulation of cooled air throughout its surrounding.

Index Terms

Air Coolers, Evaporative Cooling, Humidity, Safe design

Milk pouch Vending machine

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Abstract:--

In today world everything is going computerized and all the machines are brilliant and has higher efficiency than human. And in the long run machines are more profitable than humans. Today everyone uses gadgets and follow technology. In the dairy product world, India is the world's biggest producer and consumer of dairy Milk production totals 140bn liters a year. But in milk dispersion it is found that in numerous regions people go to milk store, in the pinnacle time of morning and night which cost them their precious time. They have to wait in long line hanging tight for getting milk from milk man or milk store. And in this covid situation it is very hard to go buy milk, wait in line, and buy the milk. This present dissemination arrangement of the need to change due to taking some time in top occasions, thus to keep away from the above issue, here we propose a method to overcome above challenges and given a gadget framework. Customers mainly buys milk from or nearby milkman with cash. In this proposed framework work with RFID card based rather than genuine paper cash. The milk disseminated by distributing the gadget according to client milk necessities. The milk pouches will be dispersed by machine according to client milk necessities.

Index Terms

Safe to use, reduce human to human contact, compact size

Design and Manufacturing of Loop Wheel Bicycle with Damper

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Abstract:--

Currently, there is escalating curiosity in bicycle riding for fitness purpose, fuel saving as well as pollution control. Bicycles are also accepted as a solution for urban transportation problems such as traffic, contamination .A Loop wheel is a wheel with integral suspension where loop is designed for better shock-absorbing performance and better comfort. Loop wheels provide a smoother ride to rider. They are much more comfortable than normal wheels. They are durable and vigorous thus the spokes of wheel reinstate by damper and loop spring.

Keywords:

Loop Wheel , Damper , Shock- absorber , hydraulic cylinder , suspension.

Simple Dual Axis Solar Tracking System

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Abstract:--

Energy crisis is one of the prime issues in the developing country like India. There's an enormous gap between generation and demand of electrical energy. Nearly 50% population of the country is extremely isolated from this blessing. Renewable energy is the only answer to solve this issue. Solar energy is one of the most effective resources of the renewable energy which could play a significant role to solve this crisis. This research presents a performance analysis of dual axis solar tracking system using Arduino. The main objective of this research is whether static solar panel is better than solar tracker or not. This work is divided into two parts, hardware and software system. In hardware part, four light dependent resistors (LDR) is used to detect the utmost light source from the sun. Two servo motors conjointly used to move the solar panel to maximum light source location perceived by the LDRs. In software part, the code is written by using C programming language and has targeted to the Arduino UNO controller. The outcome of the solar tracker system has analyzed and compared with the fixed or static solar panel found better performance in terms of voltage, current and power. Therefore, the solar tracker is proved more practical for capturing the maximum sunlight supply for star harvesting applications. Result showed dual-axis solar tracking system produced extra 10.53 watt power compared with fixed and single axis solar tracking system. [1]

Index Terms

Microcontroller, Motor, Solar, Tracking

Design and Development of Concentrated Solar Collector with Thermal Storage

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Abstract:--

In present world as we notice increasing demand of Fossil Fuel and its adverse effect on increasing Global Warming, has caused many risks to Mankind. For Sustainable Development and to reduce risks to Human Being an alternative is important. Natural resources are one of those Alternatives. As we Know Solar energy is abundant in nature and can be used for Industrial needs like Thermal energy creation. So, It has been proposed with the idea of Concentrated Solar Collector with Thermal Storage. One such Concept for using solar energy is Concentrated Solar Power. Solar energy is concentrated with the help of reflectors at a point where maximum energy can be extracted. In this project a Parabolic dish is used a reflector. At the Focal point where maximum energy is concentrated, a collector is placed. Here the collector is a vessel with a inlet and outlet for continuous flow of fluid used. The Fluid in vessel is Molten Salt which is used for thermal storage. Thermal Storage helps the use of Thermal energy in non-sunny days. A motorized setup helps this setup to follow sun and have more efficiency. As this setup uses Natural resource for Creation of Thermal Energy, it can be an alternative and used for many other Industrial purposes.

Index Terms

Concentrated Solar Power, Thermal Storage, Solar Collector, Thermal Energy, Parabolic Dish.

Automatic Contactless Sanitization Unit

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Abstract:--

COVID pandemic has influenced human life in various sectors. Various attempts were made to reduce the virus transferring by work from home, social distancing, and also including hand hygiene. So far, most of the available hand sanitizers do not operate automatically. We aim to make an automatic hand sanitizer where soap and water can come out automatically. The infrared (IR) will sense the presence of heat and motion of the object with the distance up to 50mm. It sends data to the Arduino UNO to activate the pump. If the IR sensor detects the distance of water to, he sensor 35 cm it will send data to node MCU that connect to Blink server. It can transfer the data to the output devices. The results of the hand sanitizer testing that the system can run smoothly with a minimum detection error of transferring data.

Index Terms

Automatic Unit, Arduino UNO, Contactless.

Design and Analysis of Disc Brake Rotor

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Abstract:--

A Brake is a mechanical device which is used to slowing or stopping a moving object or preventing its motion. Present work deals with structural and thermal analysis of disc brake rotor of a vehicle. Heat generation and dissipation of disc brake rotor is analysed. Further analysis is carried out to check heat flux and temperature distribution by changing thickness and material. Two thicknesses 5mm and 6mm and two materials namely Stainless Steel and Gray Cast Iron are considered for analysis in the present work. SOLIDWORKS is used for the design and ANSYS 15.0 is used for the analysis of disc brake rotor. The objective of this work is to compare temperature distribution and heat flux of disc brake rotor of two different materials. After obtaining the analysed results the manufacturing of the rotor for the best results is carried out using Laser cutting machine.

Index Terms

Structural analysis, Thermal analysis, Stainless Steel, Gray Cast Iron, Laser cutting machine.

Remote Wireless Monitoring of Smart Power System

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Abstract:--

Energy is the most essential thing in today's era. Smart grid technology is reliable and consistent electricity. Communication technologies and collection of information is a part of smart grid technology. Smart grid communication technology is a network integrating heterogeneous set of communication technologies and standards. Micro- grid is part of strategic component of smart grid as it switch on the use of renewable energy sources. It can solve the problem like electricity theft, greenhouse gases emission, unelectrified villages, depletion of fossil fuel and greenhouse effect. Smart micro-grid operates on both automatic as well as manual mode using NODEMCU microcontroller. NODEMCU is an IOT based device which performs various tasks. Due to the IOT based application the whole system can be control by mobile or any other WI-FI based device. The demand for energy increases day by day hence the smart power system is the best solution that fulfils energy demand. This system can be used in residential as well as in industry.

Keywords:

IOT, NodeMCU, Grid, Arduino, Communication

Automated Web Application Vulnerability Scanner

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Abstract:--

In recent times, use of web and web-based tech- nologies have become more popular. The web applications are the most common interface for security-sensitive information and functionality available. As web applications are sources of sensitive data, they are prone to vast numbers of web-based attacks. The majority of these attacks happen because of vulner- abilities resulting from input validation problems. Although these vulnerabilities are easy to understand and mitigate, many web developers are unaware of these security aspects. Which results in more vulnerable web applications on the Internet. Among these, the most prominent vulnerabilities are SQL Injection and Cross Site Scripting (XSS). We implemented a system which will scan the web application for the most frequent vulnerabilities in an automated manner. Our system detects flaws in web applications and presents a comprehensive report

Index Terms

SQL Injection, Cross Site Scripting, Web Applica- tion Testing, Security Scanner, Exploitation, Code Injection, Web Security, Machine Learning, Artificial Intelligence.

Heart Attack Prediction System Using IoT and Machine Learning

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Abstract:--

Nowadays, health diseases area unit increasing day by day thanks to way, hereditary. particularly heart condition has become commonest recently, therefore the lifetime of individuals is in danger. everybody has completely different values for his or her pressure level, steroid alcohol, and vital sign. however in line with medically established results the conventional values of pressure level is 120/90, steroid alcohol is 100-129 mg/dL, vital sign is seventy two, fast glucose level is one hundred mg/dL, pulse rate is 60-100bpm, graphical record is traditional, breadth of major vessels is twenty five metric linear unit within the arterial blood vessel to solely nine m within the capillaries. This paper offers the survey regarding completely different prediction and classification techniques used for predicting the danger level of every person supported their age, gender, pressure level, steroid alcohol, vital sign etc. malady Prediction system supported prognosticative modeling predicts the malady of the user supported the symptoms that the user provides as AN input to the system. this method ANalyzes the symptoms provided by the user as input and provides the likelihood of the malady as an output. malady Prediction is finished by implementing five techniques like Naive Thomas Bayes, KNN, call Tree, rectilinear regression, and Random Forest Algorithms. These techniques calculate the likelihood of the malady. so, the typical prediction accuracy likelihood of eighty one which there's obtained.

Index Terms

pulse rate device Pulse, automaton smartphone, Pulse Sensors, ECG sensor, net of Things.

Distance Fault Detection of Underground Cable

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Abstract:--

India as a developing country we must adapt to newer transmission methods i.e., underground transmission. Underground cables have their obvious advantages like lower transmission losses, lower maintenance cost also they are less susceptible to the climate change and harsh weather conditions. As we know there are two sides of coin, such system too has disadvantages
like installation is very costly and to detect the fault since cables are not visible to naked eyes. The faults occurring in such system can do permanent damage to the systems when conditions like flashover or short circuit takes place. To detect such kind of faults in the underground system and finding location of such faults. We propose a system using advance microcontrollers, voltage converter, potentiometers to locate the fault from the base station, using principle of Ohm's Law.

Index Terms

advance microcontrollers, Ohm’s law , Underground cable, Voltage converter.

Active Solar Tracking System Using PLC and SCADA

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Abstract:--

In the coming years, we will be more or less dependent on renewable energy as conventional energy resources are exhausting progressively. Solar energy is the dynamic resource of renewable energy. Yet with fixed assembly of Solar Panel, we cannot gain maximum output throughout a day. To enhance optimum energy output from the solar panel it should be accompanied with the Sun tracking system so that it will control the solar panel position according to the location of the Sun even in the bad weather conditions. In this paper, monitoring and controlling of solar panel is executed by Allen Bradley MicroLogix 1400 PLC which is the main controller of system and SCADA. With the help of LDR sensors, position of solar panel is controlled through programming by scaling, comparing LDR sensors output and accordingly PLC actuates the linear actuator to adjust solar panel to the direction of the Sun with the intention that maximum sunrays will fall on it. The generated power by solar panel is stored into the batteries using Solar charge controller and fed to the load after converting DC power to AC with inverter circuit. By PLC SCADA interface continuous monitoring of solar power generated using Real-time Trend and Historic Trend is done. DHT11 sensor is used to monitor weather conditions. A DC motor with wiper is used for cleaning mechanism of the solar panel. The proposed system is self-reliant and power generation efficiency is improved approximately to 25%.

Keywords

Programmable Logic Controller (PLC), Supervisory Control and Data Acquisition (SCADA), Light Dependent Resistor sensor (LDR), Digital Temperature Humidity sensor (DHT11).

Vibration Monitoring of Rotating Machine Using Arduino

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Abstract:--

In today's fast competitive business world manufactures are seeking every competitive advantage they mainly focus on increasing production and minimize cost while maintaining product quality. The identification of defect within machine, reducing failures and unscheduled down time is increasingly demanded of condition monitoring technologies. The purpose of the project is to reduce unscheduled down time to increasing productivity for this we are doing vibration analysis of the rotating machine. Here we are using accelerometer sensor for sensing vibration, collect data from mounting sensor stored in microcontroller. Arduino board consisting ATMega328p microcontroller sent signal to third party (pc, laptop) for further analysis. This module can be easily deployed for different rotating machine in industry.

Index Terms

IoT, Arduino, Arduino IDE, vibration monitoring, ADXL335, rotating machine

Fatigue Behaviour of Sandwich Composite Material Used in Automotive Leaf Spring

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Abstract:--

In the present work, Sandwich composite structures have a high bending stiffness which make them very suited for automotive leaf spring. Sandwich composite the typical leaf spring configuration of mahindra SUV vehicle is selected for research. The static analysis gives the safe stress and with corresponding pay load .In this reasearch the sandwich composite materials like aluminium alloy (Al 5754 & Al 3003) and carbon epoxy (CFRP) are studied.

Index Terms

Sandwich composite, Leaf Springs, Static Test, Fatigue Test.

Electric Vehicle Charging Station Design by Using NI-LAB VIEW

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Abstract:--

Worldwide environmental disquiet and the enlarging demand for energy, coupled with steady progress in renewable energy technologies, are opening up new opportunities for utilization of renewable energy resources. Solar energy is the most infinite, unbounded and clean of all the renewable energy resources till date. Due to the global warming world led to the large adoption of Electric Vehicles (EVs) which are the best substitution to IC engines. Due to increased number of EVs on road, charging of the vehicles with conventional fossil fuel based grid is not pocket friendly and effective. Thus, a renewable energy based charging station finds enormous potential and control for electric vehicle charging. An electric vehicle charging station integrating solar power and a battery energy storage system (BEES) is designed for current scenario. For uninterrupted power in the charging station an additional grid support is also considered without becoming an extra burden to the grid. By taking dynamic charging needs of EVs, the design of charging station is formulated and validated in LAB VIEW software .

Index Terms

Charging Station, Electric Vehicles, Solar, State Of Charge, Battery Energy Storage System and IOT

Detection of Three Phase Fault and Protection of System

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Abstract:--

This project presents an efficient illustration of symmetrical and asymmetrical faults which occur in transmission line. The agenda of this proposed work is to recognize the effect of various types of faults on transmission line voltage and current. Firstly, a small 3 phase system is built in Matlab/Simulink software and the voltage and current values and profile of transmission line are noticed. Then symmetrical and asymmetrical faults such as three phase faults, single line to ground faults (L-G), line to line faults (L-L) and double line to ground faults (L-L-G) are made at some sections within certain time period to recognize the change in system parameters. Further the CB (circuit breaker) operation has been included in that particular section where the fault will occur and it is seen that though the fault occurs the system is saved from any failure and also the voltage recovery takes place.

Solar Protective E-Jacket

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Abstract:--

The climatic condition is changing with era to era and are very unusual and unpredictable. Due to metabolic heat generation of our body, we are very uncomfortable in extreme conditions, especially when we have to work in difficult conditions which may led to unfortunate deaths. Some technological solution made to keep people thermally comfortable such as air conditioning unit, are most successful in helping people in their home & in cars etc. but not in mobility situation. If one wants to move in such type of climatic condition, climate adaptable jacket is a very beneficial product. This technology uses Atmega microcontroller which can naturally keep up the specific temperature inside the jacket using temperature sensor, so as to cope-up with normal body temperature i.e. (37C or 98F); it initiates the fan that is placed inside the jacket. The design of this jacket gives better protection to soldier, navy and people who are working in extreme conditions. This jacket allows the user to control and monitor the internal temperature of the jacket from high to low temperature and vice-versa, with the use of the Thermoelectric Plates and display its result. The additional features are user's health and positioning monitoring using IoT Module and Wi-Fi Module.

Keywords:

Microcontroller, Wi-Fi Module, IoT Module, Temperature Sensor, Thermoelectric Plates

Implementation of Advanced Road Trip Planner for Tourism 4.0

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Abstract:--

The main goal of Advanced Smart Road Trip Planner is to help the User to plan an entire road trip via a Single Web Application. All the tasks related to road trip planning like Selecting the Destination, along with recommendations and Interactive Maps, Facility to share the trip, Vehicle Rentals, Recommendations for nearby places to visit, popular spots auto shown, Budget Management Facilities, Checklist Facilities, Itinerary Management, User-Friendly Interface, Quick assistance through ChatBot, Feedback Forms, and many more. This Web Application will give provision to the users to plan their customized trips with a more adventurous feel.

Index Terms

Smart Recommendations, ChatBot, Maps, Web App, Itinerary, Checklist, Smart Tourism

Visualization of Furniture using CNN for Augmented Reality

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Abstract:--

Augmented Reality allows integration of 3D virtual objects into the real environment in real time thus allowing users to relate with their physical environment and making the experience more interesting. The manual conversion of the 2D images to 3D models is a tedious and time-consuming process. Hence, in this project, we automate the process of reconstruction of 3D models from 2D images using Convolutional Neural Networks (CNN). We develop a Depth-based image in the initial stage combined with CNN followed by the structural recovery and creating prediction to achieve the desired model using another CNN model. The reconstruction starts with less resolution which grows iteratively. Lastly, they are optimized using Stochastic Gradient Descent which makes them fit for use in Augmented Reality. This process of automated 2D-3D conversion is integrated with marker-less implementation of Augmented Reality through an Android Application to ultimately visualize furniture in the real world.

Index Terms

Augmented Reality, Deep Convolutional Neural Networks, 2D-to-3D Conversion, Android Application.

Dermscan: Self-diagnosis Artificial Intelligence Tool for Dermatological Disease Detection

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Abstract:--

Skin diseases are the most common diseases faced by humans. It has visible symptoms which can be used to detect diseases. This system provides quick remote non-invasive self-diagnosis. Users can access the automated image-based system via website or chatbot. The aim is to take the image of the infected area, preprocess and classify it to detect the disease using Artificial Intelligence that can help the doctors in their diagnosis. System will provide a diagnosis report as an output to the patient. The system also provides recommendation of nearby dermatologists for the users. Analysis on different classification models was done and the MobileNet model was chosen among them based on accuracy. Furthermore, the system can provide immediate relief measures and precautions.

Index Terms

Artificial Intelligence, Image Processing, Dermatology, Machine Learning

Real time Data Acquisition System for FSAE Vehicle

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Abstract:--

The need of the telemetry system for FSAE cars arose with the need to improve the car performance. For this, various factors needed to be monitored like vehicle performance, reliability, safety etc. The telemetry system to be implemented would collect the data from various sensors in a moving car and a Wi-Fi enabled host microcontroller will upload this data on a central dashboard on IoT cloud platform. The real time data can be visualized and accessed remotely This incoming data in the system can be processed and stored for later analysis Based on this data, the necessary changes can be done to enhance the performance of the vehicle. This system not only tracks and inspects the performance but also uses the data to calibrate the geometry of the mechanical systems of the vehicle.

Keywords

cloud, FSAE, IoT, microcontroller, sensors, telemetry.

PLC based Lab Automation

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Abstract:--

Applying ever growing technological advancements in the automation sector to the education systems and with the intent to make the laboratories smarter and perform experiments in favorable conditions, an idea of PLC based Lab Automation was proposed. This paper represents the implementation of different modes as per the user's convenience. Special features of this design ensure the control of the presentation environment when the projector is in use and monitoring the availability of computers while entering the room. In this project, the aim is to have control over the electronic and electrical appliances as per the user's convenience either automatically by interfacing sensors with PLC or manually by human inputs. This is achieved with the help of an emerging communication protocol OPC Unified Architecture (OPC UA) in different ways mainly focusing on Client-Server application UaExpert and Android app Prosys. The main motive behind implementing this plan is to foster a better teaching-learning environment, save time and reduce human effort.

Index Terms

Client-Server, Lab Automation, OPC-UA, PLC, PROSYS, UaExpert

Filtering Political Sentiment on Social Media

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Abstract:--

Social Media is an incredible source of appraisals, political or otherwise, therefore the domain of sentiment analysis has seen an increase in interest over the span of the last couple of years. And given the current rise of populist leaders all around the world, gauging the public's response to any political institution or candidate is vital. Sentiment analysis mines opinions at word, sentence, and document levels, and offers input polarities and characteristics of articles. We propose a system that filters out political data from the social network Twitter, using typical Machine Learning algorithms, and then performs sentiment analysis. Thus, we shall better understand the general public's opinion on certain political topics.

Keywords-

Machine Learning, Politics, Sentiment Analysis, Twitter

Design and Development of Anti-bedsore Air Mattress

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Abstract:--

An Anti-Bedsore Air Mattress is a prototype designed to help the patients who have limitation in movements and cure bedsore or pressure ulcers found in comatose patients. The objective of this prototype is to develop a user-friendly and low-cost air mattress with use of automation in the medical field. The mattress would help the patients to change the body positions after a certain interval of time by inflation and deflation of airbags and without any external help. This paper highlights the findings, methodology and results of this prototype.

Keywords –

Air Mattress, Bedsores, Pressure Ulcers

A Survey on Wall Climbing Robots based on Applications, Locomotion Methods and Adhesion Principles

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Abstract:--

Wall Climbing Robotics is a field towards which many researchers are getting attracted recently. Ample research attempts have been conducted on multiple wall climbing techniques. Though, the use of climbing robots on vertical structures, where human access is hazardous or laborious is still unsatisfactory, as most of these developments are limited to a particular surface or application so there is a demand for conducting the research. This article provides a detailed literature survey on wall- climbing robots from the year 1999 to the present by reviewing hundreds of papers to recognize and interpret progress made in this area. The purpose and contributions of this paper are to advance a distinct understanding of wall-climbing robots depending upon applications, locomotion methods, and adhesion principles. Based on conclusions from the research, four locomotion methods and four adhesion techniques are summed. Several benefits and shortcomings of each method and technique are interpreted. This study excludes stair climbing robots and pole climbing robots. The findings from this research can be helpful in designing a universal light-weight wall-climbing robot, capable of moving on any surface with high speed, and having higher payload capacity.

Index Terms

Wall Climbing Robot, Locomotion method, Adhesion method, Cleaning, Inspection, Maintenance, Surveillance.

IoT Based Distribution System Protection Scheme

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Abstract:--

Today's scenario many of the power system accident are caused because of the improper design and excessive load on the system. The project protects load to switch from surges it also protects from quick changeover. This is an inexpensive auto cut-off system, which is fabricated using relay and other discrete components. Overvoltage and under voltage are quality problems, they happen due to many reasons. The effect of overvoltage and under voltage are severe, the overvoltage can cause failure of insulation and under voltage can cause burning of motor coil. To solve problem the tripping mechanism is designed so that load is disconnected if it is subjected to overvoltage, under voltage or imbalance operation in case of three phase equipments. The design is first simulated on a virtual environment by use of simulation program and then next step is design of hardware according to simulated circuit. Two designs are made single phase and three phases, only the single phase is designed as hardware. The circuit responses are effective for voltage variation then let it be overvoltage or under voltage in case of single phase circuit and it also responds effectively for phase failure. The circuit can be stand alone circuit between supply mains and load. The overvoltage and under voltage cutoff also provides various protection1) Transients. 2) Under voltage. 3) Overvoltage. There are various types of security provided by the system: Assured for overvoltage/under voltage, insurance against homeless people and so on. For this project we have also integrated IOT based system so that it give real time data and alert regarding any fault. The project also gives a focus on password based circuit breaker. As also keypad is provided for project so that password can be entered. Fatal electrical accidents are happening and it is subject of prime concern it is due to lack of communication between line men who is to repair fault and maintenance staff at substation. So a solution is provided and it ensures safety as well. So by this ON/Off control of the line remain in hands of line man. The arrangement is made such i.e. password is entered to operate CB (ON/OFF). So by doing this lineman is able to turn off supply for time being and able to repair fault comfortably and after repair is complete he has to enter password and so line will be turned on

Three Phase Appliance Controller Using IOT

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Abstract:--

The system is based on IoT hence one can operate it from a remote location, so it will be easy for the owner to operate or control the functions of the appliances or machines through their mobiles or laptops. The raspberry pi will be used as the main controller which will control the system. As we use the controller we can use it for various appliances which work on Three Phase by programming it accordingly. It will be also connected to smartphones or laptops through the cloud. The main motive of the project is to control the appliances which cannot be controlled by workers and will be feasible for the higher authority of the organization to control the system without going to that actual place. As the cloud has been used, it will be easy to track the data as it will upload the data to the cloud and one can track it easily. Also, a control action can be made manually as well as automatically.

We are going to take a cooler for the project purpose which will be the three Phase device, there will be an air damper to control the flow of air. The air damper will be controlled by a servo motor. There will be a DHT-11 Sensor which is a Temperature & Humidity sensor. We can program the controller by setting a cut-off temperature below which the cooler will automatically start cooling.

Keywords

DHT-11, SCT-013, Cloud Computing, Raspberry Pi, Current Sensor

Thermo-structural analysis of filament wound FRP launcher tube

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Abstract:--

Artillery rockets are used in short as well as long range warfare. These rockets are mounted in circular FRP Launcher Tubes. An investigation is carried out to determine the stresses and deformations of the Launcher Tubes. Research is conducted by creating a FEA model and analysed the results by applying the relevant boundary conditions which were experimentally measured. The analysis is conducted by varying the geometry parameters and materials. By comparing the results from the analysis, the optimum geometry and material are chosen for the Launcher Tubes. The optimum performance material and thickness have been found for the launcher tube as E-glass Fiber/Epoxy and 15 mm respectively.

Index Terms

Artillery Rocket, Composites, Finite Element Analysis (FEA), Launcher Tubes.

Real Estate Recommendation using Hybrid Recommendation Algorithms

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Abstract:--

Increased digitalization has influenced real estate sector dramatically. Internet has enabled us to search, rent and buy property online. But there is hard to find the suitable property to purchase as purchasing property include lot of factor like finance, location, accessibility , etc. User purchase preferences, their likes and dislikes are a very tricky task even for humans. Many website are available for real estate but they just have standard filter feature to filter out the available property they cannot understand the full user requirement. The main help of our system to recommend suitable home to user based on user financial condition, sentiment, family, locality etc. Your system uses the sentiment analysis and considers the various factor of the property and recommend most suitable property match. First our system takes the user input which includes user details, financial condition, etc. The system also performs the sentiment analysis using various algorithms like fast Text. After the sentiment analysis user classification is done and lastly personalized recommendation is done. The input to system is the user data and the output of the system is the best home recommendation to user based on user preference. Your system also include to home price predication which will help user to buy home. Ultimate aim of the system is to recommend the best possible home to the user which perfectly matches the various requirement of the user. Currently the content based recommendation and collaborative recommendation are used in recommendation system. We are using the hybrid recommendation algorithm which combines the content based recommendation and collaborative filtering. First we are going to apply the collaborative filtering and the output of collaborative filtering will be taken as input to content based recommendation model. Hybrid recommendation algorithm will increase the accuracy of recommendation system.

Keywords

Data Science, Deep Learning, DBMS, Machine Learning, Recommender System.

Efficient Power Theft Detection Using Smart Meter Data

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Abstract:--

Electricity theft is one of the most serious problems for power supplies. Such theft of electricity is productive financial losses to operating companies. It is not possible to detect such theft in person with a large amount of data. Discovering such theft of electricity introduces a robberies' detector (GBTD) based on newer gradient boosting classifiers (GBCs): gradient overgrowth (XGBoost), by categories power boost (Cat Boost), and an easy way to increase gradient (LightGBM). XGBoost learn with one machine an algorithm that offers high accuracy in a short time. In this we are working on the pre- operation of the smart meter data at that time includes selection. The actual use of the proposed GBTD for theft recovery by reducing FPR and reducing data storage space and improving the complexity of time for GBTD classifiers receive non-technical (NTL) acquisition.

Analysis and Implementation of Computer Vision Techniques for Autonomous Driving

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Abstract:--

Autonomous driving technology is one of the fastest-growing technologies in these years. Self-driving vehicles help to reduce the number of road accidents happening every year. Various organizations, startups, and researchers are working on this technology. Due to the advances in the field of machine learning in past decades, a major push is received in the field of computer vision and various techniques like object detection, semantic segmentation, etc. are developed. A Large number of open-source datasets are available for training autonomous driving systems. The review intends to provide a deep survey about different computer vision techniques, architecture, and various datasets used for Autonomous driving technology

Index Terms

Self-driving vehicles; Machine learning; Computer vision; Dataset, semantic segmentation.

Student Feedback System Using Machine Learning

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Abstract:--

The study has been carried out to present the student feedback system analysis model for improving the quality of teaching in academics institution and universities. The system mainly presents a combination of machine learning algorithm and textual feedback. In this system has been routed towards student's feedback analysis in the form of comments, opinion, and reviews regarding the performance of teachers. The textual feedback, provides useful insights to the overall teaching quality and suggests valuable ways for improving teaching methodology. The purpose of this study is to explore the different machine learning techniques to identify its importance. The various machine learning techniques involves SVM, Random Forest, Naïve Bayes algorithm and lexical analysis out of which SVM has the best accuracy but takes more time in training for the large dataset and it is used for regression and classification to classify the text. The dataset contains valuable information about the quality of teaching and learning. We examine the textual comments present in the text document for classification of student's feedback based on polarity that is positive, negative and neutral. The system helps to reduce the manual work and collects the feedback and stores them in a database which can be authorized person. The analysis of the feedback is provided to the teacher in the form of ratings and graphs so the data visualization becomes easier. This system is an efficient approach for providing qualitative feedback for teachers that improves the students learning.

Keywords:

Feedback system, SVM algorithm, Machine learning, Naïve Bayes algorithm.

PLC Based Color Sorting Conveyor System

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Abstract:--

In manufacturing industries, there is a need of sorting objects. Manual sorting is a tedious, time-consuming, slow and non-consistent task and requires skilled labor. Whereas, automated systems are time-efficient, fast and reliable in terms of sorting. The objects may be of the same color or different. The system would be able to detect the objects and then differentiate each object based on its color. Objects may have different colors. Thus, different objects and different parameters require different type of processing.Our aim is to classify objects using image processing algorithms based on the parameter of color. The input for the system will be an image and then it will be processed for detecting the color, and accordingly the products will be further sorted using embedded algorithms. PLC will be the main controlling unit of the system. Thus, our designed automated system will be able to sort products based on their colors.

Accident Detection Using Deep Learning

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Abstract:--

Drowsiness is one of the leading causes of driving accidents, which contribute to many road deaths each year. The number of fatal and crippling road accidents is increasing day by day and is a real public health challenge. Many times, in road accidents, lives will be lost due to delays in medical care. Drowsiness is one of the leading causes of driving accidents, which contribute to many road deaths each year. This paper focuses on building an IoT-based detection and prevention system that detects risks using image processing and alerts the scene of an accident using SMS. The proposed program provides a solution to this problem. The accelerometer sensor monitors the speed of the car. Limit value fixed. If there is a change in the direction of the slope of the vehicle, the direction and if it is a speed limit exceeds the limit value. It immediately sends a signal to the microcontroller. The GSM module is active and sends a pre-stored message to emergency contacts such as relatives, hospitals, police station.

Keywords:

Danger, Death, Drowsiness, Processing Images.

Automatic License Plate Detection and Recognition

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Abstract:--

An increasing demand for transport systems has made the world a better marketplace. But with the increasing number of vehicles, management of transport services has become tedious. Unsaved information about the vehicle and its owner tends to create ambiguity errors and encourages malpractices. To avoid such scenarios, techniques like 'Automatic License Plate Recognition' are used. Several number plates are pre stored in the system. The other number plates which do not match the system's database will be denied entry. Emerging technologies such as Computer Vision, play a very central role in such systems. OCR technique is used to convert images to characters and results are further saved for verification. These systems have a wide application in parking management systems, traffic control systems and theft recovery systems.

Key words:

Computer Vision, Image processing, OCR, Python, Raspberry Pi

Design and Development of a Centrifugal Oil Cleaner

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Abstract:--

An experimental investigation has been carried out to evaluate the effects of nozzle C.D., nozzle diameter, pressure and temperature on the engine oil in a centrifugal oil cleaner. The engine oil after prolonged use needs to be filtered or else it starts affecting the engine components through which it passes. In this research work the innovative pressure driven centrifugal oil cleaner is designed and developed for the separation of unwanted particles from the oil. It is observed that the more RPM of centrifuge induces a high centrifugal force which when overcomes the viscous force produces cleaning of even smaller sized particles. The effect of reduction in temperature of oil reduces the viscosity of oil, which helps oil to become more fluid and Increase the viscous drag which ultimately makes the cleaning more efficient.

Index Terms

Centrifugal, Centrifuge, Nozzle, Viscosity, RPM.

Design of Battery Thermal Management System for an Electric Vehicle

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Abstract:--

Lithium-ion batteries are being widely used as the energy storage systems for Electric Vehicles. The LIBs are particularly sensitive to temperatures and uncontrolled heating may lead to thermal runaway hence, a battery thermal management system is required to prevent the thermal abuse of the batteries. A good design of BTMS ensures that the battery is working in its optimal temperature range thus, increasing its cycle life and performance. In this paper, heat generation profiles have been calculated for various drive cycles namely, US06, FTP-75 and UDDS, which was validated by a thermo-electric mathematical model in MATLAB Simscape. It is found that a cooling plate with S-channel design is most suitable for heat exchange applications. The control strategy proposed in this research work can regulate the battery temperature within the specified limit keeping the parasitic power at minimum.

Index Terms

Electric Vehicle, Lithium-ion battery, Battery Thermal Management System, Indirect Liquid Cooling, MATLAB Simscape.

Career Recommendation System

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Abstract:--

Recently, more and more people have begun to re-evaluate their career decisions and change careers at a later stage in life. A study conducted by GTI Media survey found that 18% of students say that they regret their choice of degree and 1,805 respondents cite a lack of initial research as the main cause of their disappointment. Also many people are confused as of which career path to choose. This can be prevented by proper counselling of young teenagers before they begin their graduate studies. In India, there are 350 million students, the biggest student population in the world. So for them to find a suitable career we need at least 1.4 million counsellors to maintain a globally acceptable student-to-school-counsellor ratio. But the number of counsellors is not the only issue there is, more often than not counsellors charge upwards of ₹2500-4000 for career counselling, which may not be financially viable to everyone. Thus, there is a need to develop a scientific career counselling software to tackle this issue.

We aim to create an app for this purpose. Here, in the proposed system, we evaluate the aptitude and personality of a person based on the user's academic level using carefully curated psychometric and aptitude tests. The user will have to give personality test and all aptitude tests in the app to get their career recommendation. The user test scores (personality & aptitude) will be fed into a machine learning algorithm, which will then generate a model to predict career streams based on the user's scores. Thus, the recommendation will be very close to accurate as all significant data related to user ability, skills and personality will be taken into consideration. Users will be given in-depth analysis of their test results and career recommendation.

Keywords:

Machine learning, Restful APIs, Big5 personality test, Recommender System, Career prediction, Android app

Voice Assistance for Visually Impaired Person

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Abstract:--

Visual impaired people with severe conditions are unable to move independently. In this fast-moving world, these people are generally left underprivileged. Few methods have been used to help them and provide them with some level of mobility comfort. Conventional methods such as trained dogs or a cane are not reliable enough in providing sufficient information of possible hindrances. There are some guidance systems which use RFID technology. However, this technology cannot be used in an outdoor open area. To overcome the above stated problems we proposed a system in this paper, an AI based system titled "Voice Assistance for Visually Impaired Persons". In order to support blind and visually impaired people's mobility indoor and outdoor, this work proposes a simple electronic guidance embedded vision system which is configurable and efficient. The system utilizes three types of devices including smart phone, Bluetooth sensor, sonar sensor, camera and Arduino no. A micro-controller processes the reflected signals from all devices in order to get an image of the obstacles and process it within a deep learning model. The system provides an affordable and reliable solution and also helps visually impaired people to be highly self-dependent.

Keywords

Image Processing, Machine Learning, Deep Learning, Object Detection, Visually Impaired, Arduino, YOLO

Web application security scanning using Machine Learning

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Abstract:--

Web and web-based technologies have gained pop- ularity in recent times. The security-sensitive information and functionalities of web application can be extracted easily. Web applications are the most common source of sensitive data, so they are more vulnerable to large number of web-based attacks. Incorrect input validation is one of the primary reasons for vulnerabilities to take place.Though these vulnerabilities are simple in nature and usually easy to mitigate, developers are unaware of security implications of this issues. This results in more vulnerable web applications on the Internet. If these vulnerabilities remain present in the web application, then it might have some severe impacts on confidentiality of user data. We implemented a system which crawls the entire web appli- cation to collect all referenced URLs and scan those URLs for the most frequent vulnerabilities like SQL Injection and Cross Site Scripting. A comprehensive report for sub types of SQL injection like Error-based, Union and Boolean SQL injection along with Cross Site Scripting, is presented to user. Each of the before-mentioned reports consists of URLs vulnerable to SQL Injection or Cross Site Scripting attacks.

Keywords

SQL Injection, Cross Site Scripting, Web Applica- tion Testing, Security Scanner, Exploitation, Code Injection, Web Security, Machine Learning, Artificial Intelligence.

Application of Feature Engineering with Regression Techniques to Analyse Fuel Economy in Order to Construct Driver Scoring System

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Abstract:--

The traditional way to calculate fuel economy is done by using odometer reading and fuel consumed by car to travel that particular distance. These methods were also used for the calculation and determining the scores for an individual driver. These approaches are very narrow in their approach as fuel economy is affected by a variety of factors and as is driver scoring. In this paper, we have predicted the fuel economy of a vehicle, based on various features extracted from telemetric data, and created a driver scoring module which scores a particular driver for a 4 Km trip according to the features selected by a user. In order to achieve this, we have implemented various feature selection and feature extraction techniques by further analyzing them with the purpose of calculating the effectiveness of those features to achieve high performance of machine learning algorithms that ultimately improves the predictive accuracy of the classifier. Furthermore, we have classified and used such features in our driver scoring module. This provides us with the information regarding the amount of influence a particular feature has on the overall fuel economy of the vehicle and helps us in driver scoring.

Keywords:

Machine Learning, Fuel Economy, Vehicle Telemetry, Data Mining, Driver Scoring, MSE, Correlated Features, R2 score, P values, Feature Engineering, Performance Analysis, Feature Extraction, Machine Learning Algorithms.

Bi-Directional Sign Language Recognition Using Machine Learning

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Abstract:--

Most of the data in the computer world is available to a few people who can read or understand a specific language. People having hearing, visual or audio impairments face issues when communicating with others. We aim to create a technique with the help of which we can establish a sound communication system between normal and deaf/dumb and blind people. Sign- To-Speech-Text-To-Image (SSTI) is a technology that converts written text into a voice that can be understood by human beings and displays text. A computer based system is an SSTI synthesizer that can read any text that is provided by standard input devices. In particular, the Marathi Sign to Speech and Text to Speech conversion application is used for the localization of computer applications.

Keywords

Stock Prediction, Data Analysis, Natural Language Processing, Machine Learning.

Sun Tracking Solar Panel Using Peturb and Observe Method

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Abstract:--

Solar energy is a very large, inexhaustible source of energy and Green Energy System. Solar energy has the major advantage over the other sources of energy that is has no impure outlets but there is a problem in collecting the energy efficiently. So this project deals with the maximum absorption and collection of solar radiations emitted by the sun and the using for generation of energy. The power from the sun intercepted by the earth is approximately 1.8x1011MW, which is many thousand times larger than the present consumption rate on the earth of all commercial energy sources. Solar tracking system can be used as a power generating method from sunlight. This method of power generation is simple and is taken from natural resource. This needs only maximum sunlight to generate power. This project presents for power generation and sensor based solar tracking system to utilize the maximum solar energy through solar panel by setting the equipment to get maximum sunlight automatically in real time. This proposed system is tracking for maximum intensity of light. When there is decrease in intensity of light, this system automatically changes its direction to get maximum intensity of light. The proposed method is to design an electronic circuit to sense the intensity of light and control the DC motor driver for the panel movement, and construct a Buck- Boost converter for to step up and step-down the voltage, and store the maximum utilized output voltage in Lead-Acid Battery.

Keywords:

Buck-Booster Converter ,DC geared motor, Energy 1.8x1011MW, Microcontroller

IoT Based Sanitizer Bot

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Abstract:--

Commercial places are more likely to be a source of infectious diseases than in residential places. Sanitizing reduces the growth of viruses, fungi, and types of harmful bacteria. You can clean every day, but you should always sanitize to keep your home or workplace safe. For Eg. hospitals, Industrial & commercial areas. The functioning of the Iot based sanitizer bot seems to be very simple and effective as one simply needs to control via mobile and instantly the bot moves from one place to another and spray the sanitizer / disinfectant on the required place. It can be used easily by everyone, starting from a kid to an elderly person.

The Sanitizer bot is an IoT enabled platform, based on an several components, two servo motors, a hand sanitizer bottle, and few electrical and physical connections.

Index Terms

NodeMCU(ES8266), Relay, Stepper Motor, Driver IC(L293D)

Design and Simulation of Solar Powered Vapour Compression Refrigeration System

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Abstract:--

Due to the growing concern and awareness of environmental issues among the scientific community, power generation from renewable energy sources, particularly solar energy has become significantly important for the last few decades. Solar energy is abundantly available in India hence, it has a high potential to use as an alternative to non-renewable energy sources.Refrigerated storage, which is believed to be best method for storing the fruits and vegetablesin fresh form, is not available in rural or remote locations where grid electricity is almost not available.So, without having a conventional energy source at these areas, the present study was taken upto design and fabricate Solar powered VCR system.In this system electrical energy has been replaced with solar energy which will reduce the consumption of high grade electrical energy. It consists of solar panel, Lead-acid battery, inverter, charge controller and VCR system. We have selected all the solar components by calculating its capacities as per the capacity of compressor used for VCR system. VCR calculations have been done using Coolpack software which is an user friendly software.VCR system is simulated using Aspen Hysys v11 software and the desired results were obtained. Solar PV panel system is simulated using Matlab/Simulink software from which current and power curves were obtained for different values of irradiance at a constant temperature.

Index Terms—

VCR, Solar PV system, Simulink, Aspen Hysys v11

Theoretical Water Loss Calculation for Adiabatic Cooling of Fin-Fan Water Cooler

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Abstract:--

In this paper the main intention is to get an idea of year round water consumption for adiabatic cooling of fin fan water cooler with theoretical calculations made for water saving. So fin fan cooler with adiabatic pads is used. In these types of systems cellulose pads are placed before the fan. Small amount of water is sprayed on these pads to make them wet. When air passes through the wet pads temperature of air goes down which results in getting cool and humidified air. Currently these are estimated with ISHRAE weather data along with pad saturation efficiencies. As more and more water is evaporated scales are formed on pads which results in increase in pressure drops and reduction in saturation efficiencies. So it is need to estimate water consumption by this system.

Keywords:

Fin-Fan cooler, Adiabatic Pad, Water-loss.

Alternative Material Selection and Analysis of Solar Panel Mounting Structure

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Abstract:--

One of the applications of using solar energy is photovoltaic systems. So in order to install a durable photovoltaic system that will last for over a desirable period of time and work efficiently, selecting the most suitable components is crucial. Although it represents only a small proportion of the overall construction, the mounting system carries a heavy responsibility, providing the necessary support for the most important and expensive part of the system – the solar modules. Thus the paper brings forth various alternative materials to the conventional ones, loads the structure is subjected to, design and analysis of the structure using CAD, ANSYS and STAAD Pro and then the cost analysis of the same.

Index Terms

ANSYS, Mounting Structure, Photovoltaic System, STAAD Pro, SOLIDWORKS

Precision Farming Using LoRa Technology

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Abstract:--

Agriculture is the most important sector in human life. This sector provides all fundamental necessities to human beings. Agriculture sector also plays a vital role in the economy. Using modern IOT based technologies we can improve our traditional farming to the next level. This paper puts forward the idea of the use of LoRa technology for the improvisation of our traditional methodologies of farming. With the help of this, farmers can measure the moisture of soil, temperature, humidity, and pH level of soil using different sensors, LoRa technology, and Cloud computing technology. The data generated from different modules is collected at gateway and gateway sends that data to Things Network thereafter all that organized information is given to end-user. Then end-user must take appropriate action on data. This whole process is done with low power consumption and with a wide range of access. Using LoRa gateway about 10Km range we can access data and take action on data. LoRa Technology and cloud computing enhance the rapid growth of the agricultural sector and modernization. This helps in getting solutions to agriculture and farming-related queries.

Air Pollution Monitoring Using Lora

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Abstract:--

Air pollution is becoming a major problem worldwide. It is observed that air pollutants increase with increasing industrialization, which causes various health problems for mankind and harms nature. The proposed system is based on the Internet of Things (IoT) and cloud technologies, which are the latest technologies today. In addition, our air pollution monitoring system uses wireless remote communication technology (LoRa) compared to traditional methods. The purpose of this study is to provide a system that will allow us to measure the level of air pollution and monitor air quality. In this context, we also offer a comparison between LoRa and the traditional Wi-Fi method [1]. We also justify our choice of LoRa over Wi-Fi technology. The proposed air pollution monitoring system allows us to get real-time data related to pollutants present, results show that the air pollution monitoring system for large areas of application is very inexpensive to record and assess the extent of air pollution and to protect nature and mankind from poor air quality.

Keywords-

Air Pollution Monitoring, Air Quality, Lora Technology, Optical Dust Sensor.

Extension of Travelling Range by Powering Electric Vehicle with Wind Energy

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Abstract:--

One of the limitations of the electric vehicles is their short travel range compared to their excessive charging time. The travel range can be extended by charging the battery while in motion. This paper presents a design to charge the Electric Vehicle (EV) while running using renewable energy source. The proposed EV design utilizes wind energy to charge battery while the vehicle is being driven. An electric powered vehicle has a bank of batteries that runs the entire vehicle. This paper is on charging the batteries of the vehicle on the run. This is done by using the wind that acts opposite of a moving car. This process can go on till the vehicle is completely charged or the driver finds a charging station. This paper mainly focuses on the design of the wind powered car and to determine the power required for driving the system.

Keywords

Wind Power, Electric vehicle, Turbines, Battery, Travelling range

Static Structural Analysis of SAE Baja Chassis

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Abstract:--

The roll cage of Baja vehicle can be of various types, comprising a tubular structure of various dimensions, but all complying with the official rulebook issued by Baja SAE India. Since the vehicle is expected to perform in off-road conditions, various static and dynamic forces are applied on the chassis, and during these off-road conditions, the main motive of roll cage is to ensure total safety of the driver and to assemble and mount other vehicle components. The chassis of the vehicle is first designed in Solidworks 2018 and then analysed in ANSYS 2019.

Keywords:

Baja Chassis, FEA, Roll Cage Analysis, ANSYS

Multi-objective Multi-Criteria Optimal Placement of Reactive power compensating devices in Distribution Network by IEHO-TOPSIS Approach

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Abstract:--

Optimal Placement of reactive power compensating devices (OPRPCD) at distribution system is a very crucial and essential which results into minimization of losses, voltage profile improvement, cost minimization of reactive power support, maximized techno economic benefits to consumer and system operator while improving overall system performance and reliability. This problem is a complex, non-convex, non-linear, multi-objective which requires multi objective Multi-criteria decision-making (MOMCDM) approach. In literature, Objectives of reactive power compensation has been to minimize the power losses. But, actually it has more than one objective that depends upon the reactive power compensation device. Financial Benefit from reactive power support also requires to be considered which is of utmost importance for all stakeholders. In this paper OPRPCD is performed considering financial benefit by an objective of reactive power cost minimization along with other objectives like power loss minimization, maximization of voltage stability and minimization of voltage deviation with an application of a recently developed MOMCDM technique known as Improved Elephant Herd Optimization with TOPSIS approach (IEHO-TOPSIS) and is therefore new in its kind. This is applied to the modified IEEE 33 bus radial distribution system. Different Reactive power compensating devices considered are Distributed generation (DG's), Batteries, capacitors, Distribution Static Synchronous Compensator (D-STATCOM) and Electric vehicle charging stations. The results show the merit of this method over the existing ones.

Keywords:

Optimal, Reactive power, Distribution network, Improved Elephant Herd optimization

Comparative Analysis of Tetrahedrons and Hexahedrons for Finite Element Mesh during Static Structural Analysis of Universal Joint

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Abstract:--

It is a challenge for mechanical engineers to determine the exact values of stresses and transmitted forces using conventional analytical methods. Therefore, the use of commercial finite element software has increased almost exponentially in the industry to provide fast and near accurate predictions with appropriate visual aid. Ansys has become a leading software among the masses for various analysis. Ansys provides a variety of type of finite elements of which two are Tetrahedron and Hexahedron. This study aims for a side-by-side comparison of the use of above mentioned elements in the Static Structural analysis using Ansys software by varying the size of the elements. The Universal joint (UV) is a very important component of power and torque transmission in two shafts which are not parallel to one another. Used in one way or the other in everyday life, like vehicles, its analysis is very crucial since it undergoes torque and forces exerted by user as well as reaction forces from the assembly. It has been observed that the results for deformation are just as expected with accuracy improving as mesh is better, but for stress, tetrahedral model gives a slightly unexpected result.

Keywords:

Universal Joint (UV), FEA, Steering, Ansys, Solidworks

Effect of Element order and span angle of Static Structural and Modal analysis on Shock Absorber of Vehicle using Ansys

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Abstract:--

Wellbeing and driving comfort for a vehicle's driver are both dependent on the vehicle's suspension framework. Wellbeing suggests to the vehicle's taking care of and slowing down capacities. The comfort of the inhabitants of a vehicle corresponds to sleepiness and capacity to travel significant distance with insignificant disturbance. Shock absorbers are a basic piece of a suspension framework, associating the vehicle to its wheels. Basically, shock absorbers are gadgets that smooth out a drive experienced by a vehicle, and suitably disperse or ingest the motor energy.

Basically, in this paper we have shown the effect of element order and span angle of static structural analysis on the shock absorber and the modal analysis to check the criteria of failure. We have taken a shock absorber of a vehicle. For the 3d modeling and assembly of shock absorber we have used solid works 20. The analysis part is done by using ANSYS 2021 student version. The static structural analysis is done on the shock absorber to check the effect of element order and shape angle. Modal analysis is done to check the harmonic frequency of the absorber, how the components amplitude will vary according to the different frequencies.

From the analysis we can conclude that while meshing by changing the span angle center number of nodes and number of elements increases from coarse then medium and highest in fine in linear as well as quadratic element order also number of nodes and number of elements are more in quadratic order than in linear. from the harmonic frequency we can conclude that if the natural frequency of the absorber matches with the forced calculated frequency i.e., 274.7 Hz at 1200N.then resonance will take place and component will fail.

Keywords

Ansys, Mesh, Springs, dampers, shock absorber

Study to compare Element Order and Span Angle Center in Finite Element Mesh for Static Structural Analysis for 737-800 wing without winglets

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Abstract:--

Finite Element Analysis (FEA) is a virtual method for predicting how a component reacts to real world forces, vibration, heat, fluid flow, and other physical activities. Finite element analysis shows whether a product will break or not on application of these real-world parameters. It is used to predict the behaviour of the component when interacted with real world.

In this current study, a comparison of static structural analysis is done on a 737-800 wing without winglets using ANSYS WORKBENCH by changing the element order and span angle center while meshing the component. Linear and quadratic order of element is used in this analysis with span angle center as coarse and fine.

It was observed that the number of nodes and elements changed by considering linear and quadratic element order with coarse and fine

span angle center. The number of nodes were greater in quadratic element order than in linear element order.

In static structural analysis of the component, it was observed that the value for maximum equivalent stress (von mises) and total deformation for linear and quadratic element order was greater in span angle center fine and was least in coarse.

Index terms

Ansys Workbench, Static Structural Analysis, Mesh, 737-800 Wing Without Winglets, Span Angle Center, Element Order.

Plant leaves classification using ANN, FuzzyLogic and Multilayerperceptron Algorithm

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Abstract:--

In agriculture the originality of the plants or crop is lost or degrading due to pollution existing in air and water.This has resulted in large number of increase in chemicals among fruits and vegatables. Therefore, it becomes important to protect the plants or crop from such pollution and to avoid hybridization in them. To keep the plant organic and healthy it is important to detect the diseases in them at a very early stage. So that they can be cured easily.The very well known plantvillage dataset is used in this system. It consists of plants like potato,tomato,peach,corn,soyabean,grapes,apple,etc. It consists of the images of the leaves of the plant along with the diseases of it. Ann,Fuzzylogic and MultilayerPerceptron algorithm is used in this system. Thepade's Block truncation coding is done on this dataset. One novelty approach is being added in this approach. Block truncation coding is a image compression technique used to extract the features of the images in a form of array. Thepade's block truncation code extends the block truncation coding. Hence, it is applied on this dataset. And it is compared with the proposed Thepade's Block truncation coding, it is found that the accuracy of the algorithms of the normal TSBTC approach is found to be less as compared to the accuracy of the proposed Thepade's Block truncation coding approach.

Keywords:

ANN,Fuzzylogic, MultiLayerperceptron algorithm, thepade's sorted block truncation code.

Face Mask Detection Using Deep Learning

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Abstract:--

Corona virus is an infectious disease which affects different people in different ways. This is worst pandemic in 100 years. Corona virus spread mainly from person to person. Wearing face mask in public areas is one of the protection method of it. To overcome this worst pandemic situation government makes face mask compulsory in public places. The goal of this paper is to detect face mask using deep learning model. This will help to detect which faces contain mask and which does not contain mask. This paper proposed a way to detects face mask using ResNet and ResNext model with Adam and Nadam Optimizer and performance is calculated using accuracy

Index Terms -

Face mask, Optimizers techniques, Deep Learning, ResNet, ResNext.

Content-Based Image Retrieval Algorithms and Techniques: A Survey

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Abstract:--

As per the daily increase in data on all over the internet people have access to huge amount of graphical information like photos, logos, drawing etc. Hence finding desired graphics is becoming difficult and difficult. Many text- based search engines are available which uses metadata of the image, but there are very less amount of search engines which accepts images as query. Hence there is a need of search engine which should search images through content of image not by text or metadata of that image. Creating Image based search engine require finding suitable algorithms and techniques for image retrieval. So, in this paper we have compared some of the different techniques and algorithms available in domain.

Keywords

SIFT, CNN, DNN, CBIR, DOG.

Identification of Pedestrian Movement and Classification using Deep Learning for Advanced Driver Assistance System

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Abstract:--

Prediction of pedestrian behavior is the most challenging task in today's era. Especially, in India, it is very important when a pedestrian is crossing the road to avoid accidents and at the same time not unnecessarily slow down the traffic. The pedestrian's direction of movement finds its application in autonomous driver assistance, security surveillance and robotics. To improve the safety of the pedestrians and to enable the cars to drive independently or assist the driver in real life situations, people flow analysis at road crossings and junctions is of utmost importance. There have been many proposed algorithms to detect a pedestrian and its movement but automation industries still are in search of a robust, efficient, simple and more accurate systems to achieve the desired goal. In recent years, Histogram of Gradients (HOG) and Support Vector Machines (SVM) have been new flanged methods for object detection, classification and segmentation. But eventually, Convolutional Neural Networks (CNN) a cutting-edge technique in deep learning, a subset of machine learning, has proved its accuracy and reliability for similar tasks in computer vision. We present a system that recognizes a pedestrian moving in a particular direction using Convolutional Neural Networks. By thoroughly studying, understanding and augmenting stagewise detection method we propose an innovative thought process that helps achieve better precision as compared to legacy techniques like Histogram of Gradients and Support Vector Machines that involve more computational time.

Keywords-

ADAS, CNN, deep learning, pedestrian classification, pedestrian identification.

Review of Deep learning and Interpretability

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Abstract:--

Deep learning has revolutionized Machine Learning. Deep Convolution networks play a pivotal role in Image classification. A conventional image classification technique requires extensive feature engineering; this approach is exhaustive as rigorous manual efforts are needed. Deep learning automatically detects the feature set required for classification. It uses backpropagation to achieve this. Deep learning is being used in a variety of applications including healthcare. The use of deep learning specifically in Cancer biology is significant. For Pathologists, classifying tumors as benign or malignant is a complicated task. Classification of malignant lymphoma is challenging as features are not uniform across whole slides and there are various patterns for classification of cancer. Deep learning is ideal for such a scenario where automated feature learning is required further deep learning detects features that are invariant to the location in an image. Tumor Region-wise classification of a slide can also be achieved which can be further subjected to recurrent neural networks. Textual explanations of cancer regions can be generated, providing further insights into diagnosis. Here three different cancer datasets are reviewed and subjected to deep learning methods. Explainable AI approaches can be applied to decision trees as well as on gradient boosted trees to obtain explanations.

Index Terms

Deep learning, Deep CNN, Cancer Classification, Pathology, Explainable AI.

A Review on Battery Thermal Management Systems in Electric Vehicles: Current and Future trends

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Abstract:--

The lithium ion (Li-ion) battery chemistry has become the primary power source for electric vehicle application due to its long cycle life, high energy density and high power density. However, the operation and performance of these batteries is largely dependent on maintaining a proper temperature range. Failure to mitigate high temperatures causes thermal runaway which leads to battery fire or explosion. Therefore, an efficacious battery thermal management system is vital to ensure optimal performance and safety. This paper has reviewed the heat generation mechanism and its impact on battery life and capacity. Further, the various thermal management techniques including air cooling, liquid cooling, phase change material and heat pipes have been comprehensively studied and compared. Battery heating is a key measure to ensure efficient performance under cold weather conditions and a special section has been included on the same. Finally, the current and future industry trends in temperature controlling methods have been discussed to assist future research in this area.

Keywords:

Battery thermal management system; Lithium ion battery; Phase change material; Temperature Range; Thermal runaway

Waste Minimization Using Six Sigma in Residential Project

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Abstract:--

Six Sigma has been implemented in the manufacturing and other services industries, it is still a relatively new concept in the construction sector. The concept of using DMAIC (Define, Measure, Analysis, Improve, Control) of Six Sigma is being used in the present study to minimise the waste generated in the construction operations. In the define stage, the problem of wastages in construction activities was identified and accordingly, the problem was defined as "Waste Minimization". In the measure stage , based on the estimated quantities and the experience of the site engineer and project manager, various factors responsible for wastages of materials is determined. The factors identified were prioritized based on the survey carried out. In the third phase, a detailed analysis of the quantities and wastages was calculated. Based on the analysis, improvements are suggested. The implementation of Project Management and Material Management was recommended at the control phase. Based on the implementation of the Six sigma a considerable improvement was observed.

Keywords:

Six Sigma, DMAIC, Wastage, Materials

Comparative Analysis of Deep Learning Techniques for Classification of Fetal Brain Abnormalities

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Abstract:--

Magnetic resonance imaging of fetuses allows doctors to observe brain abnormalities early on. Therefore, it is necessary to detect and classify the fetal brain abnormalities at an early age, since up to 0.3 percent of pregnant women have fetuses with an abnormal brain. The literature survey finds less work for the classification of the abnormal fetal brain and is based on conventional methods of Machine Learning, while more related work is done for the segmentation and feature extraction by using different techniques .From the study, it is observed that deep learning techniques retrieves good classification accuracy than machine learning techniques. In this paper, we have used Convolutional Neural Network (CNN) to classify fetal brain MRI images into normal and abnormal class. Also this review considered the investigation and comparative study of recent techniques used in classification of fetal brain MR images. In this paper, we have used data augmentation method to overcome the problem of over-fitting occurs due to limited dataset. We are concluding this study with a discussion of the challenges of deep learning techniques proposed to detect and classify the fetal brain abnormality and their possible future. The main aim of this study is to compare the results of recent techniques used for classification of fetal brain MRI based on the performance metrics to predict the best model.

Index Terms

fetal brain MRI, Machine learning, Image processing, Segmentation, Augmentation.

Design and Development of Additive Manufacturing Setup with Moving Bed for Safety Equipment

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Abstract:--

Digital fabrication technology, also referred to as 3D printing or additive manufacturing, creates physical objects from a geometrical representation by successive addition of materials. 3D printing technology is a fast-emerging technology. Nowadays, 3D Printing is widely used in the world. 3D printing technology increasingly used for the mass customization, production of any types of open source designs in the field of agriculture, in healthcare, automotive industry, locomotive industry and aviation industries. Additive manufacturing is technique in which 3D objects are printed with the help of CAD (computer-aided design) software. Different processes are available in 3D printing technology such as FDM (fused deposition method), SLS(selective laser sintering), EBM (electron beam machining, LOM(laminated object manufacturing), DLP (digital light processing),etc. In this paper, we have focused on the design and fabrication of a portable 3D printer which can be constructed economically. We are using 4 axis mechanisms where 3 axes are x-y-z and the fourth axis is an extruder. The process adopted by us is FDM technology, in which different the materials like PLA (polylacticacid, ABS (acrylonitrile butadiene styrene), HIPS (high impact polystyrene), etc. By heating any of the filament material to its melting point and it is deposited layer by layer. Combination of many layers of such type will give us a final 3D model.

Index Terms

3D Printer, CAD, PLA, ABS, HIPS

Comparative study of Element Order in Finite Element Mesh for Static Structural Analysis for bracket of a Pulley Support System

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Abstract:--

Finite Element Analysis is a method used to determine how a product reacts to forces, heat, flow rate, stress, deformation and other physical effects acting on the body in a computerized way. It is broadly used to solve Partial Differential Equations which are required in the Engineering Applications. Static Structural Analysis is offered FEA software's which helps to solve complex structural engineering problems more efficiently. It helps to determine the stress, strain, forces and other effects caused by the loads on the body.

In the present study a comparison for static structural analysis is done on bracket of a pulley support assembly by changing the element order while meshing. In this analysis Linear and quadratic order of element is used by changing the span angle center that is coarse, medium and fine.

It is observed that in linear and quadratic element order the number of nodes and number of elements were least in span angle center coarse and highest in fine. Also the number of element and number of nodes in quadratic element order were greater than in linear.

Also in the static structural analysis we observed that in linear and quadratic element order maximum equivalent stress was least in span angle center coarse and highest in fine, and the total deformation was least in coarse and highest in fine.

Index Terms

Ansys, Mesh, Pulley support Assembly, Element Order, Workbench, Static Structural Analysis.

Review on Data Mining Techniques in Information System for Quality Assessment and Metrics Calculation

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Abstract:--

Data mining is an important aspect of data extraction and data analysis. As technology is increasing exponentially massive amount of data is generated every second. The same thing happens with organizations also. A number of organizations have launched lots of information systems for the welfare of the citizens. Lots of data have generated through this system every year at every level. Analyzing such data is very important for enhancing the effectiveness of the system. This effectiveness could be achieved by using various data mining tools, techniques, and algorithms. Many classification and prediction methods have been proposed by researchers in data mining and they also have proposed different approaches for data collection, preprocessing, and feature extraction. From the deep study of existing methodology, it was found that there is a framework available to fulfill the business objectives and customer needs, a number of classifier algorithms are available for data mining, but they can work with only a small dataset. They do not achieve accuracy with the large dataset. Some algorithm reduces lots of labor work and improves efficiency, but they are time-consuming and have some limitations. To overcome these all problems, there is a need for a new method, which will be based on data mining, its algorithm, and the technique. Without data mining, it is hard to understand the full perspective of data collected by the Information system.

Index Terms

Data Mining, Metrics, Data abstraction, Quality assessment

Study & Review of Properties & Applications of Low Heat Cement

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Abstract:--

Low Heat Cement is specially blended to provide a lower heat of hydration in concrete. This unique attribute makes it ideal for mass concrete pours where the rate of temperature rise and the maximum temperature achieved must be controlled in order to reduce the risk of thermal cracking.It is manufactured by modifying the chemical composition of normal Portland cement.

Hydration of cement is an exothermic action which produces large quantity of heat.Crack formation in large body of concrete due to heat of hydration has focussed the attention of the concrete technologists to produce a kind of cement which produces less heat or the same amount of heat, at a low rate during the hydration process. Cement having this property was developed in U.S.A. during 1930 for use in mass concrete construction, such as dams, where temperature rise by the heat of hydration can become excessively large. A low-heat evolution is achieved by reducing the contents of C3S and C3A which are the compounds evolving the maximum heat of hydration and increasing C2S. Chemical action of hardening will be be reduced by reduction of temperature, which will further restrict the rate of evolution of heat. The rate of evolution of heat will, therefore, be less and evolution of heat will extend over a longer period. Therefore, the feature of low-heat cement is a slow rate of gain of strength. But the ultimate strength of low-heat cement is the same as that of ordinary Portland cement

An Experimentation on Properties of Geo-polymer Concrete with fibres

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Abstract:--

Geo-polymer concrete, deemed by the researchers as the new age concrete is considered as a replacement to its conventional counterpart portland cement concrete. Already a lot of research work has gone into development and opportunities for Geo-polymer concrete or cement less concrete as they call it. Everyone is now vary of the environmental impact of usage of cement and still it is worldwide the most broadly used constituent for almost all construction purposes. Geo-polymer concrete uses pozzolans and other cementitious materials to replace completely the Portland cement that is used on a large scale for producing concrete. Apart from water it uses solutions known as alkali activators to react with the source materials to form geocement through a process called Geo-polymerization. This Geo-polymer concrete has been studied by researchers in the past years and these studies conclude that Geo-polymer concrete is superior to the cement concrete from the structural and durability consideration. But Geo-polymer concrete suffers from some major drawbacks like being weak in tension just like its conventional counterpart and it needs accelerated curing for gaining its high early strength. In this research, we had understood the result of different fibres on theinherent properties of Geo-polymer concrete.

Index Terms

Cement void concrete, fibres, geopolymer, pozzolans

Privacy Enhancing Techniques for Gradients in Federated Machine Learning

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Abstract:--

A Federated Learning (FL) technique is widely applied in many fields as instead of gathering the training data centrally, model is trained locally with participant's data. Applications such as Medical imaging, next word prediction, and speech prediction are widely using FL because these kinds of applications have sensitive and private data. Although FL avoids sharing of actual data, it also faces various privacies and security concerns. The adversaries can actively or passively attack the participant's privacy from the shared model. There are main two issues to handle in FL: (1) Protecting user's privacy (2) and integrity of the averaged model (gradients). Currently there is no such a single solution for privacy preservation which is applicable for all situations. But applications may adapt different Privacy Enhancing Technologies (PETs) to fulfill the different privacy and security priorities. Many researchers have proposed a solution to tackle with the security and privacy challenges in FL. The research is going on for improving privacy and security of participant's private data using various techniques such as Homomorphic Encryption (HE), Trusted Execution Environments (TEE), Differential Privacy Preservation (DPP) and Secure Multi-party Computation (SMC). This paper demonstrates how the gradients can be inverted to get the original image and later it discusses the approaches to protect the privacy and security of participant's data in FL.

Index Terms

Reconstructing images, inverting gradients, privacy enhancing techniques, Security in federated learning

User Counselling Voice Controlled Chatbot AI Powered Human Interaction

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Abstract:--

Emotion recognition from speech signals is an important but challenging component of Human-Computer Interaction (HCI). In speech emotion recognition (SER), many techniques have been utilized to extract emotions from signals, including many well-established speech analysis and classification techniques. Deep Learning techniques have been proposed as an alternative to traditional techniques in SER. This paper presents an overview of Deep Learning techniques and discusses some recent literature surveys where these methods are utilized for speech-based emotion recognition. The review covers databases used, emotions extracted, contributions made toward speech emotion recognition and limitations related to it. The chatbot will be used for user counselling, for those going through something they do not wish to share with other people but still receive the help they deserve. This project uses Dialogflow as well as CNN algorithms to implement a well-rehearsed and improved chatbot for modern-day therapy. As opposed to most recent developments in chatbot working and the use of deep learning techniques for the same, this work has gone on to embed text, image and voice based models for more accurate and human-like experience for the user.

Smart Gadget for Women Safety Using IoT

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Abstract:--

Women safety has always been an issue even in these modern times with so much advancement in technology. Women are not safe anywhere and are most vulnerable when traveling alone into lonely roads and deserted places. Existing hand held safety devices for women require human intervention for activating the device such as pressing the button or shaking the device etc after sensing the danger. We propose a solution which will try to overcome the disadvantages of the existing systems and also aim at providing false proof safety to women. The proposed work aims at designing an Internet of Things (IoT) based safety device that relies on providing security to women by fingerprint-based method of connectivity to the device and alerting nearby people and police when a woman is not safe. An unsafe situation is sensed by fingerprint verification for a minute then it will automatically alert nearby people and police if the device senses no signal. Moreover, for first-hand safety, a shock wave generator is also designed that women can use to attack the perpetrator. Additional features such as sending group messages, audio recording are also part of the proposed design. A mobile app is designed for women safety where safe locations from the victim's current location will be shown on the map so that women can reach the safe place from her current location.

Index Terms

Internet of things(IoT), Atmega328p, ESP8266 , thingspeak cloud

Prospectives of Micro Combined Heat and Power (Chp) System Based on Diesel Generator Sets

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Abstract:--

Diesel (DG) generator sets are being extensively used in defence applications in remote inaccessible deployment areas as the only source of electrical power and in other accessible areas as the source of back-up power. Cost incurred for purchase, supply and stocking of diesel at the remote forward post (altitudes from 8000 ft- 21000 ft with temperatures falling down below -30 degree Celsius) is substantial. This places a heavy burden on the logistic supply chain of defence forces for maintenance of these forward logistic bases and forward posts. The high cost incurred in terms of rupees as well as the lives lost require that every drop of fuel be used effectively and efficiently. Waste heat recovery from DG sets provides one such opportunity to effectively utilise the energy presently being wasted through exhaust.

An attempt has been made in this paper to highlight, potential of waste heat recovery from DG sets held with defence forces followed by a review of upcoming waste heat recovery technologies. In this study, DG set has been retrofitted with a waste heat recovery system to produce both power and heat in usable form converting it into a micro-CHP system. Detailed analysis of the DG set as a micro-CHP system has been covered in the paper. The paper highlights various applications of heat generated from micro-CHP system in defence applications. To sum up a radiant cooling/heating system using heat generated from micro-CHP system has also been proposed for space heating and domestic hot water (DHW) in high altitude areas.

Index Terms

CHP, space heating, DHW, Waste Heat Recovery

Dynamic Pothole Detection and Reporting System

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Abstract:--

The problem of bad roads and potholes is one of the most pressing concerns in cities. It can be traced to two major issues – inefficient manual reporting and recording of potholes and/or lack of accountability with regard to repairing roads. To automate the process of reporting and recording potholes/bad patches of road, we propose a dynamic pothole detection and reporting system which gathers reports from the user and streamlines the flow of information among the concerned authorities and civilians, ensuring transparency. The system is bilateral in nature as it includes two components, namely, an android application for the civilians, and a web application for the concerned civil department. The android application has two modes – Driving Mode and Pedestrian Mode. Through the Pedestrian Mode, the user can capture an image of the pothole to report. The Driving Mode includes a dynamic, on-the-go pothole detector that uses the accelerometer & gyroscope built into the user's smartphone. A Support Vector Classifier is used to classify the jerks recorded by the accelerometer & gyroscope as potholes. The real-time GPS location is dynamically recorded in both modes. The Web Application includes the reported potholes/bad patches of roads with their location and functionalities such as hierarchically delegating tasks among the maintenance personnel, progress monitoring using deadlines, progress bars, etc., and finally, notifying users on completion of tasks.

Index Terms

Dynamic pothole detection, SVM, Accelerometer, Gyroscope, GPS, Repair progress, Android, Web application

Improvement in video object detection methods using classification

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Abstract:--

In the field of computer vision, object detection from the video sequences is an interest point for many vision based application like, video surveillance, traffic controlling, action recognition, driverless cars and robotics etc. The task of object detection includes localization and classification. From video frames data is extracted to predict the objects in which task of drawing a bounding box around one or more objects is called localization and task of assigning label is classification. The object detection from video sequences can be feature based, template based, classifier based and motion based. Current paper focus on factors involve in classification improvement for object detection. The experimentation is done using CIFAR 100, Pascal and COCO dataset, it is observed that the accuracy of CNN changes with change in training data and epochs. The CNN used as image classifier with Keras. The experimentation proved that there is linear relation between the training data and accuracy of classifier.

Key words:

Object detection, Deep Learning, Classification

Mobility prediction by static neural networks in Ad-Hoc Network

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Abstract:--

Most challenging problem of ad hoc network is how to adapt the mobility of the nodes consisting of a network the adaptability to the mobility affects the performance of the network. Having an accurate mobility prediction, provides a very positive impact on various challenges and network issues such as limited bandwidth, dynamic topology, routing overhead, hidden terminal problem, packet losses due to transmission errors, mobility induced route changes, battery constraints and security threats. In this paper, we used static neural networks to predict node trajectory time series. Static neural networks are basic types of artificial neural networks without feedback and time delay input it can be used for predicting node trajectory time series problems. Each neural network that used in this paper acts as mobility predictor model to predict the future location of a mobile node. At the end, all neural networks are used to solve this problem and their result are compared and analyzed.

Index Terms

Ad-Hoc Network, Mobility Prediction, Static neural networks

Design and Simulation of a Smart Flower Solar System with Sun Tracking

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Abstract:--

Renewable energy is in high demand these days because of the limited stock of the other energy resources such as fuel, coal, gas, and other sources. Solar energy is a source of renewable energy which is abundantly available. There are two main issues with solar energy, dust build-up on the surface solar panels and which are permanently installed. The power output of the solar panel could be reduced by 35% due to dust particles on the surface, and the power output of the fixed solar panel was also reduced by 35% compared to the sun-tracking solar panel. The aim was to solve issues related to the solar panel's power output reduction as the sun angle changed during the day as well as the accumulation of dust on the solar panel. The solution was to create a mechatronic device that could monitor the sun in two axes. The solar panel is designed in the shape of the smart flower and it is protecting the solar panel when the weather condition is not good. The challenge was to design the system that similar to sunflower by lightweight material. The proposed model was designed in SOLIDWORKS software and validated MATLAB/Simulink Software. The control circuit was designed and simulated in Tinkercad software.

Index Terms

Sunflower solar panel, Sun tracking, Two axis solar tracker.

Age and Gender Detection Using CNN

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Abstract:--

In recent years, much effort has been put forth to balance age and sexuality. It has been reported that the age can be accurately measured under controlled areas such as front faces, no speech, and stationary lighting conditions. However, it is not intended to achieve the same level of accuracy in the real world environment due to the wide variation in camera use, positioning, and lighting conditions. In this paper, we use a recently proposed mechanism to study equipment called covariate shift adaptation to reduce the change in lighting conditions between the laboratory and the working environment. By examining actual age estimates, we demonstrate the usefulness of our proposed approach.

Index Terms

Face Detection, Skin Colour Segmentation, Face Features extraction, Feature's recognition, Fuzzy rules.

The Use of SiO_2/Deionized Water Nanofluid to Improve the Performance of a Solar Parabolic Trough Collector Fitted with Single Axis Tracking

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Abstract:--

The use of Nanofluids can improve the efficiency of solar collectors. The Nanofluid is more conductive than the basic fluid. As a result, it can absorb the most concentrated incident solar radiation while simultaneously improving the heat transfer characteristics of the base fluid. The experimental research was carried out to evaluate the performance of a Parabolic Trough Collector outfitted with single axis tracking and employing deionized water based SiO2 nanofluid as the working fluid. In this experiment, a 0.3 percent volume of SiO2 nanoparticles concentration was used for study, and experiments were performed with varied mass flow rates of SiO2/deionized water nanofluid (0.01kg/s, 0.02kg/s, and 0.03kg/s). The results revealed that employing 0.3 percent volume concentration of SiO2 nanofluid with 0.01kg/s mass flow rate of SiO2/deionized water nanofluid resulted in enhanced performance of a Parabolic Trough Collector. Under outdoor conditions, it is also compared to ordinary fluid.

Index Terms

Nano fluids, conductivity, solar radiation, heat transfer, conventional fluid.

Design of Portable Solar Dryer and Mounting with Solar Tracking for Urban Household Use

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Abstract:--

Many traditional Indian food items require solar-dried products. The drying process is also essential for the preservation of products like grains, pickles, and fruits. Numerous types of solar dryers have been developed around the world as an alternative to Electrical dryers requiring non-renewable energy. Rapid urbanization has led to a reduction in the size of the houses and the unavailability of open spaces in apartment culture. The current discussion proposes innovative models that can be used for household purpose. Provisions have been made to make maximum solar energy available with the help of sliders and a solar tracking mechanism. The feasibility of the model was further tested by structural analysis.

Index Terms

Solar dryer, Product design, Renewable energy, Solar tracking, CAD

Driver Distraction estimation using Deep learning

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Abstract:--

The Driver distraction is one of the leading causes of collisions or accidents on the road. These approaches have also been highly problematic as they have led to fatal accidents with massive casualties. A Distracted Driver can be extremely dangerous, this is due to the fact the distracted driver does not have their attention on the roads. The attention on the road is crucial as the roads are constantly changing conditions and a large number of high momentum and high velocity vehicles can quickly become extremely dangerous. The distracted driver has a slower response time in a high speed scenario, where the decreased reaction time can lead to catastrophic failure. Therefore, there is a need for an effective mechanism for the purpose of enabling driver distraction detection using Recurrent neural networks and Decision Tree. The approach has been subjected to the extensive evaluations through the performance metric of Precision and Recall which has resulted in satisfactory results.

Index Terms

Region of Interest, Recurrent Neural Network, Decision Tree, Entropy Estimation.

Investigation of Rigid Body Oscillation Energy

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Abstract:--

The energy of different type of oscillations is presented in various physical processes in nature. This type of energy is quite widespread in nature and utilization is quite limited. The paper presents the possibility to exploit this type of energy and make conversion of vibration energy into useful electrical energy. Paper presents two different prototypes which are capable to transfer above mentioned energy.
First part of the research is intended to theoretical and numerical analysis of different type of harmonic motions of simple pendulum.
Such 3-D motion is usually very complicated and that is why the focus of investigation was done to numerical simulations.
The research represents an innovative solution for converting oscillation energy into electricity. Exploitation of this type of energy can be carried out in freight road and rail transport and in shipping. The solution represents the possibility of reducing the consumption of large amounts of fossil fuels. ANSYS Rigid Dynamics software was used to analyze the general 3D oscillation of rigid bodies.
The paper presents two different prototypes that use the kinetic energy of the magnet in the torus - a Torus-type generator (TTG) and the oscillation of a classical pendulum connected to a generator - an eccentric type generator (ETG). The research was carried out using various numerical analyses and experimental research in the laboratory.

Index Terms

Oscillation energy, rigid body, motion, computer aided engineering, experimental study.

School Bus Safety System

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Abstract:--

Safer transportation of school children has been critical issue as it is often observed that, kids miss the bus or ride the wrong bus with no way to track them or driver get drunk and that cause accident or bus may get hijack. This project intends to find yet another solution to solve this problem by developing a bus safety system that will record the entry and exit of students from the bus using RFID technology and GSM to inform their parents about whether student present or absent. The system has GPS for tracking, IR sensor and alcohol sensor to detect drunk or drowsy driver and relay for stopping the bus if driver is drowsy, Buzzer for the alert indication in addition to that Status of Message

Index Terms

Arduino, RFID Technology, GPS, GSM, Sensors

Digital Marketing Influence on Customer Impulsive Buying in the E-commerce Era

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Abstract:--

The paper uncovers the impact and influence of Digital Marketing on Customer causing impulsive buying in the E-commerce era. We are living in the digital age where consumers have become more elegant, and their buying intention is radically transforming from traditional to online buying behavior. This study investigates the impact of digital marketing (DM) tools on consumers' online impulsive buying tendencies i.e., effective and cognitive tendencies with intervening role of the gender and education-level. One hundred fifty surveys were randomly distributed to online shoppers in Bangalore, India. This study demonstrates certain directions for academicians and practitioners.

A Comparative Study on the Present Scenario of Management Institute of Shivaji University and Savitribai Phule Pune University (Maharashtra) in respect of Admission and Placement

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Abstract:--

For an accurate study of the management education, it becomes necessary to glance the brief history of origin and development of management education. It's during this context that a profile of management education system in India and Maharashtra is provided here, because it's that the study unit for this research work. Education could also be an element that develops a personal as a whole. India is one of the countries that have rich history of education as an example Nalanda and Takshila universities are more a claimed over world. Over the quantity institutions are providing quality education. Thus, India is boasting to be a strong nation with skilled human capital. And addition to this, management education is assumed as a basic support to spice up the country's growth to its peak. Management education was the origin of the industrialization and thus the supplier of human capital in us of America during 19th century. At beginning the management school was established with courses offered in finance and economy. Rather MBA came forward at Harvard with a faculty of 15 with 80 students. The economy is taken under consideration as a supplier of qualified graduates of the tutorial system. Its requirement creates the branching of education that considers trade, commerce and industry and business management.

Index Terms

Management education, admission, placements, quality education, skill

Conceptualising the Digital Marketing Strategies in Retail Industry

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Abstract:--

Digital Marketing is one of the most prominent used tools in the 21st-century marketing world. One of its most important features is that it can be customized to suit the need, requirement, time and funds availability of the business. It is effective and advanced than the anachronistic marketing tools, as it adds a human touch to marketing. Digital Marketing adds an experience and convenience factor to a product, which is critical for good revenue, customer retention, and customer service. It also contributes to developing a product, which suits customers' expectations, demand and total customer cost by customer engagement, and feedback. When combined with other marketing and finance tools like SEOs and ROI, it can deliver better and exceptional results in the retail segment. The inception of digital marketing was started with the introduction of the World Wide Web. One of the most primitive but effective forms of the same was email marketing. Digital Marketing grew with the growth of technology. Today, we have webpages; apps, search engine optimization and recent-most artificial intelligence-based marketing tools taking shape. However, these tools do not guarantee success as it depends on how planned the marketing strategy was and how well it was executed.

Index Terms

Digital marketing, Search Engine Optimization, Artificial Intelligence, Retail, Marketing Tools

Footstep Power Generation System Using Piezo Electric Transducer

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Abstract:--

Man has needed and utilized energy at a broaden rate for the food and prosperity since the days of yore. Because of this a ton of energy assets have been depleted and squandered. A Proposition for the usage of disuse energy of foot power with human velocity is a lot of significant for profoundly populated nations like India, where the railroad station, sanctuaries and so forth, are packed all nonstop. In this research the power energy is created by human strides and the power energy is changed over into mechanical energy by piezo transducers, then gathered and used as a power source, power is delivered by DC generator. Then, this force source has numerous applications as in Agriculture, road lighting, home application and as an energy source for sensors in distant areas.

Structural and optical properties of SnS nanoparticles

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Abstract:--

In this work SnS nanoparticles were synthesized by homogenous precipitation method using stannous chloride (SnCl3) and thioacetamide as precursor solutions. For the present study we have prepared samples by varying the molarity of SnS from 0.1 M to 0.6 M to investigate the influence of Sn on the structural and optical of SnS nanoparticles. The sample SnS1 (0.1 M) has crystal orientation along [122], [211] planes, but with increase in molarity of SnCl3 there is change in crystal orientation to [211], [141] and [120] planes belonging to the orthorhombic structure of SnS. The elemental Sn is much higher in SnS6 samples which has high molarity (0.6 M) of SnCl3, there is formation of elemental Sn. Apart from that a significant change in the crystal orientation where there is a suppression of other planes corresponding to SnS and growth along [041] plane is evident. The SnS1 sample does not show any Raman peaks. The SnS2 sample has vibrational modes corresponding to 187 cm-1, 225 cm-1 and 280 cm-1 corresponding to the vibrational modes. The mode at 187 cm-1 and 280 cm-1 modes doesn't exist in other samples as the Sn concentration increases but the 225 cm-1 mode is more prominent. SnS belongs to space group D162h with 21 optical phonons in which 7 are inactive, 7 are infrared active and 12 are Raman active. The observed modes are Ag, B3g and B1g. The band gap of the SnS nanoparticles obtained from the tauc plot depicts an increase in the band gap with increase in Sn concentration. The blueshift is due to decrease in particle size with increase in molarity of SnCl3. The tin mono sulphide quantum dots are very poor emitters of light and has low quantum efficiency. The emission spectra of the SnS when irradiated with 400 nm Xenon arc lamp has peaks at 476 nm - 481 nm is due to band to band emission and is in agreement with the band gap of SnS nanoparticles. The emission at 534 nm, 560 nm and 600 nm corresponds to the defect emission at SnS nanoparticles. The emission at 600 nm is influenced by the variation of Sn concentration in the sample. Figure 5 shows the laser induced (400 nm) photoluminescence of SnS nanoparticles. The emission intensity is very weak for the SnS1 sample with low Sn concentration and increases with increase in Sn concentration. The increase is not linear and shows a sudden increase for SnS4 samples. The emission intensity is maximum for SnS4 sample and with further increase in Sn the intensity reduces and is completely quenched for SnS6 samples. The properties makes the SnS nanoparticles with high Sn concentration suitable for multiple device applications.

Static and Dynamic Analysis of Radome

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Abstract:--

Radomes (Radar Domes) are characterized as electromagnetic windows, comprising of spreads or lodgings that serve to shield electronic hardware from effects of environment influences such as dust, wind and rain. The selection of materials and shape depend upon the radome application. In this paper, zirconia based ceramic material and silicone resin were used for the study. The design of radome depends on the several mechanical factors such as unpredictable outline, non-uniform pressure, non-isotropic materials, impact loads and thermal loads. In this study, a sandwich shaped multi-layered wall structure was modelled using CATIA V5. Further, static and dynamic analysis of radome was carried out under varying boundary conditions. In addition, thermal analysis of radome was analysed using Fluent. The results of the study are shows that zirconia based radomes have good performance over other materials.

Index Terms

Radome, Zirconia, Dynamic Analysis, Thermal stress distribution

Seismic Response of Reinforced Concrete Building Using Recurrent Neural Network

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Abstract:--

Simulation modeling is the process of creating and analyzing a digital prototype of a physical model to predict its performance in the real world. To establish a simulated model, a structural analysis is necessary to demonstrate the functional behaviour of the construction structure .The finite element model is one of the most common techniques to analyze the behaviour of the structural elements at the same time while computing the dynamic behaviour of the buildings using FEM having some difficulties in attaining optimal design. These types of issues solved by adopting another technique that provides better design results. In this work, Recurrent Neural Networks are used to predict the seismic behaviour of RC buildings. Two buildings are used to predict seismic behaviour. The first example is 11 story building in which Tuned Mass Damper (TMD) is used, and the second example is a 27 story building in which a semi-active mid-story isolation system is used. Both devices are semi-active control devices. The RNN model is trained with the help of five earthquakes and artificial ground motions. Two ground motions and two historical earthquakes are used to train the model. The results revealed that the RNN model provides better results than the FEM model.

Index Terms

Recurrent Neural Network (RNN), Tuned Mass Damper (TMD), semi-active mid-story isolation, FEM model

Arduino Based Firefighting Robot

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Abstract:--

If a fire is detected early, huge losses can be avoided, with great deprivation and lack. If a fire is detected early, important assets can be avoided. The field of robotics is widely known for its multiple settings abilities. The robot consists of a measuring device and a fire extinguisher. An infrared (thermal) sensor will measure acceptable distance and heat will cause the fire extinguisher to act according to the environment it perceives. We used a virtual robot application to control the movement of the robot. And among them, we use the Bluetooth module to provide the controller and android. The controller can connect to the Bluetooth module through the UART protocol, the command sent from android, and the app provides control.

Keywords :

Firefighter robot, Arduino, Flame sensor, Bluetooth module, Sprinkler

Design and Analysis of Thermoelectric Air Cooling in Bladeless Fans

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Dr. P. M. Bagade, Prof. PVPIT, Pune

Abstract:--

It has been observed that a significant amount of electricity is used in cooling and refrigeration system in both residential household and industrial offices and plants. Moreover cooling system find there use in crucial areas such as pharmaceutical and food industries. The air conditioning systems mainly are based on vapour compression cycle (VCR) and evaporative cooling. For small space vapour compression cycle are not economical to employ. Evaporative cooling cannot be used in enclosed spaces as the evaporation increases the humidity of the air inside the space. In this study the use of thermoelectric cooling is explored for cooling a space. Peltier module is being used to obtain the desired cooling effect. These systems are easy to install and use. A bladeless fan produces air flow patterns with no or minimum vibrations this makes the system quieter than traditional fans or blowers. This project aim to study the computational analysis of the thermoelectric cooling in bladeless fan. Ansys simulation for the same is carried out of which various plots for temperature distribution and transient temperature variation was plotted.

Keywords

Bladeless fan, Peltier module, Thermoelectric cooling.

Thermal Performance Analysis, Testing and Characterization of Mini-Parabolic Trough Solar Collector

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Abstract:--

Solar is one of the most attractive options among all renewable energy resources especially for countries with abundant sunlight exposure. This study presents the experimental investigation on performance testing of mini-parabolic trough solar collector. This mini-PTSC is economical, small in size and works with minimal tracking adjustment. The experimental tests have been carried out and monitored in Pune. Considering many industrial processes such as dehydration, drying, electroplating, dyeing, degreasing, washing, etc. need hot water in the range of 85^0C to 95^0C. Besides these, many processes in food processing, paper and pulp, textile and surface treatment sector need the same temperature range. The efficiency tests were performed in a temperature range from 85^0C to 95^0C, and mass flow rate of 0.1 kg/s to 0.5 kg/s, respectively. In the performance analysis, the intensity of solar radiation incident on the collector plate, collector inlet and outlet temperature, ambient temperature, wind speed, Instantaneous efficiency of the collector, and the variation in mass flow rate of the working fluid (water) were investigated. The performance tests show that the obtained characteristic curve of the tested collector is considerably favourable for Industrial Process Heat (IPH) applications requiring thermal energy need lower than 95^0C.

Index Terms

Renewable Energy, Concentrating Collectors, Parabolic trough Solar collector, Instantaneous Efficiency, Solar Heating System

Simulation of CRDI vehicle and effect of aftertreatment devices

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Abstract:--

The project aims at simulation of diesel vehicle and the effect of aftertreatment devices on emissions of vehicle in mathematical environment. Environmental degradation due to pollution is increasing also emission norms of vehicles are becoming more and more stringent. Newer technologies are developing to attain the target of reduction in emissions. Aftertreatment devices like diesel oxidation catalyst (DOC) is used to oxidize CO and HC, diesel particulate filter (DPF) is used to trap particulate matter and selective catalytic reduction (SCR) is used for reduction of NOx. In this project, simulation of light-duty diesel vehicle is performed and results are validated with actual data. Simulation of above devices provided reliable results as well as variation of different parameters within the components helped to improve the efficiency of system. Based on the reduction of emission, the conversion efficiency of aftertreatment system is calculated. Optimization of geometrical parameters of diesel oxidation catalyst and diesel particulate filter is done to further improve the performance of system.

Index Terms

Diesel Oxidation Catalyst, Diesel Particulate Filter, Selective Catalytic Reduction

Evolutionary Algorithms Based Structural Damage Detection Using Finite Element Model

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Abstract:--

Detection of structural damages depending on the finite element (FE) method has become a development path of growing attention in the technology sectors of mechanical, civil, and automotive, etc., throughout the recent years. Evolutionary Algorithms (EAs) represent a form of realistic approach for upgrading the FE system. The current analysis aims to classify complex building various damaged scenarios leveraging evolutionary FE model updating oriented algorithms. Resonant frequencies variations of a structural system are seen as an evaluation criterion for the phenomenon of damages. For failure diagnosis, the variations in fundamental frequency have been used as inputs to numerous objective functions. Objective functions were employed concerning natural frequency ranges, mode configurations, modal consistency, and modal strain energies, and its output was evaluated. The challenges of building damage identification are initially modified into a conventional objective function associated with dependent variables. Afterward, the EA is used to overcome the issue of modeling for the location and severity of building damages. The EAs, which include the Genetic Algorithm (GA), Differential Evolution (DE), and Particle Swarm Optimization (PSO), are integrated to FE model updating to identify and correlate the results of damage in a configurable 3D four-storey structural system. Eventually, a FE model of the undamaged system and simulation model for the response to damages is generated. The effectiveness of the algorithm associated with the constantly updating of the FE model for failure identification was therefore analyzed.

Key words:

Evolutionary algorithms, Finite element model updating, Structural damage detection, Objective functions, Genetic Algorithm, Differential Evolution, and Particle Swarm Optimization.

Predictive Analysis of Air Cooled Condenser by Considering Fouling Using Machine Learning Algorithm

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Abstract:--

Refrigeration and air-conditioning plays a major role in the energy consumption which results in huge demand of energy. An experimental study is done to investigate performance variation such as pressure drop, compressor power, and superheated temperature, coefficient of performance, cooling capacity due to the fouling across condenser by particle deposition of various sizes on fin and tube heat exchanger. Characterization of deposition should be obtained from experimental observations related to air cooled condenser. There is gradual blockage of condenser by artificial fouling. Data of experimental setup should be used to develop the model for assessment of fouling and remaining useful life of condenser. Developed predictive model validity would have to be applied for wide applications of heat exchanger .The database will be used for a designer to generate a machine learning algorithm to develop the correlation. . The study will provide the predicted data of system based on current operating conditions with R410a as refrigerant. Different machine learning algorithms is used to predict the fouling and finding the best algorithm by validating with the experimental results.

Index Terms

condenser, fouling, machine learning, regression.

Experimental Investigation of Machining Parameters in Edm of Inconel-800 Using Different Electrodes

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Abstract:--

In the present study, Inconel 800 is employed as the work piece material . Inconel alloys are well-known in the industrial world for their corrosion resistance and ability to preserve structural integrity in high-temperature environments. As a dielectric medium, commercial EDM oil is employed. Electro discharge machining (EDM) can effectively cut Inconel 800 alloy, but choosing the right machining process parameters to maximise its machinability is a difficult task for researchers. A review of the literature reveals that a number of studies have been conducted on the performance of EDM utilising various types of electrodes. However, few research has been published on electro discharge machining with Inconel 800 alloy as the workpiece and Aluminum, Brass, or Copper together as electrode materials. The machinability of Inconel 800 alloy was investigated experimentally utilising the electro discharge machining (EDM) technique in this study. The investigation uses a variety of tool materials, including aluminium, brass, and copper. In terms of tool wear rate (TWR), material removal rate (MRR), and surface roughness, performance characteristics are determined using process parameters such as pulse on time, peak current, and gap voltage. The Taguchi L27 array is used for testing. Taguchi analysis is used to perform single-objective optimization. Grey Relational Analysis (GRA) is used to perform multiobjective optimization. MINITAB 19 is used to examine the most relevant parameters using analysis of variance (ANOVA) and the F-test with a 95% confidence interval.

Keywords :

EDM , Inconel 800 , TOPSIS , GRA

Design and Conceptualization Driver in loop Simulator for ADAS Verification and Validation

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Abstract:--

This research paper presents the Design and Conceptualization Driver in loop Simulator for ADVANCED DRIVER ASSISTANCE SYSTEM Verification and Validation. Advanced driver assistance systems, or ADAS, are the systems to assist the driver in the driving process. Driving simulators are most commonly used for development of vehicle system, human factor study and vehicle safety research like testing ADAS functions with help of creating virtual environment in safe and tight controlled environment. With the help of driving simulator, designers test the vehicle for different Advanced Driver Assistance System function along with driver safety. Main purpose of driving simulator is convincing the human that they are travelling in particular speed, direction and orientation when in fact they are not. The objective of this paper is find out the different parameters related dynamic driving simulator.. This paper comprises of working principle of dynamic driving simulator, difference between static and dynamic simulator, need of driving simulator and parameters of driving simulator.

Index Terms

ADAS, Driver in loop, Dynamic Driving Simulator, Static Driving Simulator, Stewart Platform

Model based Verification and Validation of LiDAR sensor

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Abstract:--

This research paper presents the study of modelling and validating the results of simulation of LiDAR sensor with actual sensor data. The model can be further utilized for virtual testing of various ADAS functions. The virtual sensor is a physics-based sensor capable of emulating the real sensor. Initially an in-depth study of Velodyne VLP-16 sensor was carried out in order to parameterize the virtual sensor model. The sensor is modelled virtually in Gazebo simulation environment. Gazebo is used along with ROS (Robotic Operating Interface) in order to record the sensor data. Data conversion from sensor message format to cartesian co-ordinates has been carried out. This was done in order to have a common format of actual and virtual data for validation. Four different objects were selected for validating the sensor data. The validation methodology is based on comparison of actual recorded data generated by Velodyne VLP-16 LiDAR and virtually generated data by the virtual LiDAR sensor model. The validation proves that the in case of static scenarios, the virtual lidar sensor model is 99 % accurate in measuring the range to the object. Although there is slight deviation from the actual value, it is in the acceptable limits.

Index Terms

LiDAR sensor -Data Conversion, Modelling, Selection, Parameter Selection and Calculation, Scenario Generation, Virtual Data recording.

Sizing and Simulation of Powertrain of Three Wheeler Electric Vehicle

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Abstract:--

This research paper presents the study of designing, modelling and validating the results of simulation of powertrain of 3-wheeler electric vehicle with literature results. According to force and torque requirement at wheels, required power rating of motor is calculated. Indian driving cycle is used to calculate energy consumption by vehicle. Battery chemistry and sizing is selected according to energy requirement. According to requirement of power and constraints, type of motor is selected along with gear reduction calculation to achieve required torque and acceleration. For precise control of motor speed because of road profiles and traffic conditions control strategy is designed. All these subsystems are modelled on simulation platform and comparison with theoretical calculations will be carried out. The objective of this paper is to design, model and optimize the performance of electric vehicle in terms of powertrain and try to match the performance parameters with conventional IC-engine vehicle. This paper comprises of designing electric subsystems, creating control strategies for better performance and model based simulation to check the performance.

Keywords

Battery Selection. Electric Vehicle, Motor Selection, Powertrain, Retrofitment, Simulation, Three-wheeler.

CFD simulation for condensation of humid air over vertical plate with Eulerian Wall Film approach

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K. Parashar, Lead Engineer, Whirlpool of India Ltd, Pune

Abstract:--

This article presents simulation methodology for simulating condensation of humid air which is mixture of condensable water vapour and non-condensable air over a vertical flat plate. Numerical modelling of condensation with additional non-condensable gases has been a challenging task for researchers due to coupling of species transport with other fundamental governing equations. Eulerian wall film multiphase model in commercial Ansys FLUENT software is used with coupling with species transport equation. Coupling is achieved by diffusion balance model which takes into account diffusion-controlled film condensation of water vapour over a plate. The model is validated on CONAN experiments by Amborsini et al. (2008) wherein mixture of steam and air flow into a square cross section duct with water used as coolant. Condensation rates, heat flux and correlation based on heat and mass transfer analogy are validated using CONAN benchmarking data. In all simulations, only condensation on wall is considered and condensation in volume is neglected because it's very low contribution in film condensation. This study provides a methodology to simulate condensation in presence of non-condensable gas without use of any additional user-defined functions.

Index Terms

CFD, Eulerian wall film, Noncondensable gas, Vapour Condensation

Comparative Study & Structural Behavior of Telecommunication Monopole Towers with and without Camouflaged under the Influence of Wind load

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Abstract:--

The purpose of the proposed research is to study the structural behavior of monopole towers with and without camouflaged with different heights of towers 30m and 35m for the basic wind speed of 44.44m/s,39m/s as per latest current code ANSI/TIA 222-H.Most studies and research have shown only structural behavior of monopole towers with other type of lattice towers. Proposed research is very important due to the fact that the structural engineer faces the challenging job of designing and constructing telecommunication towers to support all loads in open weather with high degree of reliability. Free standing lattice towers are generally used in all over the world. As per the recent surveys, mobile towers in the world are likely to grow very fast due to the introduction of 5G technology which requires more antennas on the towers, with existing monopole towers already occupied with lot of antennas with no structural capacity to withstand extra load on towers. New camouflaged designs in monopole are going to study in this research to improve monopole structural capacity and structural behavior to withstand new loads. Environmental and economic pressures have initiated to seek improved design approaches to make communication towers more environmentally acceptable and cost effective. Since monopole structures have smaller dimension and require lesser space for installation, they can be used as a suitable alternate for lattice towers. Some researchers observed in their study that monopole towers have higher lateral displacements and lesser monopole structural capacity than self supporting towers. In this proposed research a new camouflaged technical design is developed to study the structural behavior of monopole towers. This research shall be helpful for determining lateral displacement(tilt)of monopole, monopole capacity and effect of wind speeds for different heights of monopole towers with and without camouflaged under the influence of wind load.

Index Terms

Staad Pro V8i, monopole tower, antenna loads, basic wind speed, lateral displacement (tilt), monopole capacity, camouflaged cladding.

Optimization of Heat Sink Analytical Model through Evolutionary Computation Algorithm

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Abstract:--

Heat Sinks are the most integral part of the Electronic Devices which helps in quick dissipation of heat and thus protect them from overheating. Due to continuous effort to increase the power density within minimum space, the design of highly efficient heat sinks become mandatory for proper functioning of devices. In this paper, a quick method to optimize the Plate Fin Heat Sinks with fixed number of Heat Sources has been discussed. A new Analytical Model has been introduced that can perform quick temperature evaluations of electronic devices in a much shorter time and can be used as a replacement for CFD. The main goal of this paper is to present an Evolutionary Algorithm where the Analytical Model can be taken as an objective and can be checked for thousands of heat sink geometries for quick evaluation of highly efficient heat sink design. The resulting model is applicable for forced convection plate fin heat sinks with fully developed laminar air flow between channels.

Index Terms

Analytical Model, CFD, Evolutionary Algorithm, Forced Convection, Fully Developed Laminar Flow, Plate Fin Heat Sinks

Study of Air Flow Measurement in the Diesel Engine Intake System Using Venturi Based Airflow Sensor in 1D-3D Coupled Simulation

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Abstract:--

During the development of modern low emission Diesel engines, precise air intake flow measurement is necessary to verify the better control in engine combustion parameters like EGR, Exhaust Gas Aftertreatments in terms of flow considering different engine operating conditions and presence of exhaust gases recirculation (EGR) affecting the variations in the measurement system, Venturi based mass flow calculation based on pressure pulsation is the main outcome from this study, by predicting the mass flow, actual engine testing and calibration efforts can be minimized. calculation techniques were used as follow: • 1D modelling as well as 3D modelling was used • 1D model was built using AVL Boost tool and 3D modelling was done using computational fluid dynamics in AVL Fire workflow. First results were obtained from 1D model to match the target engine performance in terms of Power, fuel consumption, EGR characteristics and 3D model running in coupled condition to minimize the simulation time. 1D modelling was focused in performance issues (torque and power); 3D modelling was a Crank angle base, multiphase calculation, looking for qualitative results like density and mixing of gases, to verify pressure Fluctuations., it means: • 1D model and 3D model were run simultaneously, • 1D flow results at Venturi inlet was passed to CFD model and used as boundary conditions and • 3D flow results at Venturi outlet was passed to 1D model and used as boundary conditions to continue the flow calculation.

Index Terms

1D-3D coupling simulation, Engine Intake system, Airflow measurement.

Structural Health Monitoring of Gantry Girder using Fibre Bragg Grating Sensors

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Dr.Beena Mol M, Assistant Professor, LBS College of Engineering

Abstract:--

Most of the industries have an in-build overhead crane that helps in lifting and transportation of heavy loads from one location of work place to another. Gantry girders are provided to support the loads transmitted through the moving wheels of the overhead cranes. The paper presents the structural health monitoring (SHM) practices that can be implemented for damage detection of gantry girder using Fiber Bragg Grating (FBG) sensors that are positioned on the key parts of the crane. The sensor is designed for monitoring the stress and strain of the girder. The alternating stress was determined based on distributed fiber bragg grating strain sensors. The analysis of the signals based on finite element (FE) models helps to determine the safety condition of the crane.

Index Terms

Gantry girders, structural health monitoring, Fiber Bragg Grating sensors, finite element models.

Biosynthesis of silver nanoparticles using Eryngium foetidum extract and its antibacterial activity

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Abstract:--

Nanotechnology has been widely applied in various fields of research due to broad applications. Biosynthesis using herbal extracts has recently emerged for nanoparticle synthesis based on many useful advantages. Traditional herbs which possess biological activities are important sources not only in bio-medicinal and pharmaceutical purpose but also in nanoparticle synthesis. This research, therefore, aims to study biosynthesis of silver nanoparticles (AgNPs) from aqueous herbal extract of Eryngium foetidum. Characterizations of the AgNPs were analyzed using UV-Visible spectroscopy, Fourier Transform Infra-red spectroscopy, dynamic light scattering (DLS), and scanning electron microscopy. Results were carried out and demonstrated a surface plasmon resonance of AgNPs at the maximum wavelength of 443 nm. An average size of particles was 83.91 nm determined by DLS. The AgNPs synthesized from E. foetidum extract exhibited antibacterial activity against Escherichia coli (E. coli) with a minimal inhibitory concentration (MIC) and minimal bactericidal concentration (MBC) at 10% (v/v). In conclusion, the herbal extract of E. foetidum showed the successful biosynthesis of AgNPs and manifested inhibition of E. coli by a simple process and eco-friendly system.

Index Terms

Nanoparticles, Biosynthesis, Eryngium foetidum, antibacterial activity

Seismic Behaviour of Sprc Cutting Walls With Different Steel Content and Axial Stress Ratios

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Abstract:--

Steel plate reinforced concrete (SPRC) composite shear walls, which are made out of steel sections embedded in limit elements and an embedded steel plate in the wall web, have been utilized in super-elevated structures. When exposed to uncommon quake loads, combined tension-bending-shear activities are frequently created in the shear walls of super-elevated structures in light of the increasing demand for a more noteworthy tallness width ratio. In light of semi static tests on seven SPRC shear walls under tension-bending loads, the seismic behavior of SPRC shear walls with different steel-content ratios and axial tension ratios was investigated. The failure mode, strength and relocation capacity, stiffness degradation, shear deformation, damping coefficient, strain, and cracking of each test example are presented in detail. This paper showed that the FE model predicted the heap uprooting relationship, stiffness degradation, and extreme capacity with a healthy degree of precision. In light of the test outcomes, a design strategy is proposed for predicting a definitive strength of the SPRC shear walls under tension-bending combined burdens, and proposals for improved anchorage design are proposed.

Index Terms

Steel plate shear walls (SPSW), Stiffened or unstiffened, Material non-linearity, shear strength capacity, experimental work, connectivity, codal provision, Design methodologies.

IoT Based Smart Helmet for Accident Management

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Abstract:--

Road accidents have become huge concerns as it leads to many death and injuries in day to day life. India faces a very high rate of accidents. The losses due to such accidents are huge and the number of lives lost is also unmeasurable. Each year across the country around 4,40,042 cases are reported, of which 1,39,091 people lose their lives. The first hour after the incident is said to be the Golden Hour as it is critical. Many accident victims wait for assistance or aid at the site and a hindrance detriment them their life. This paper proposes an IOT based Smart Helmet which gives information about the accident to the nearest Ambulance or Hospital in a very short span of time. This device not only gives information about the accident but also tells the location of the accident so that the ambulance can reach the right location in a very short span of time and save the life of the injured person.

Keywords:

Accidents, IoT, Safety Devices, Smart Helmet, Wireless Sensors.

CHAT BOT: An online conversation

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Abstract:--

A CHATBOT is a piece of artificial intelligence software that can converse with humans in their own language. These carefully developed chatbots may usually communicate by audio or written means, and they can easily imitate human speaking languages to communicate in a human-like manner.

Keywords

converse, communicate , imitate

Biomedical Concept Relations and Dependency Analysis for Low Resource Language

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Abstract:--

The COVID-19 pandemic swept across the world rapidly infecting more than two million people in India and resulting in the death of almost 1,20,000 at a mortality rate of about 6 percent. The research findings, data resources, informatics tools and technologies being openly shared, aiming to speed up the fight against such emerging pandemic are not available in Indian languages like Marathi and Hindi. The litera- ture describes several tools and techniques used for extracting important Biomedical information like diseases, symptoms, medical conditions, virus, vaccine, impact on patients, etc. all in the English language. In this paper, we propose methodologies for extracting biomedical entities, creating a Hindi parallel dictionary for biomedical entities, finding diseases with medical conditions, and finding the impact of drugs administered to COVID patients, is demonstrated with extracted relations between biomedical entities.

Comparative Studies on Conventional Copper Electrode and Electroplated Copper Electrode Made By FDM in Die Sink EDM

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Abstract:--

This study aims to conduct a detailed performance analysis of conventional copper electrodes, and FDM printed coated electrodes in die sink EDM. The rapid prototyping (RP) technique named 'Fused Deposition Modeling (FDM)' is employed to form electrodes using Acrylonitrile butadiene styrene (ABS) plastic, and metallization of FDM electrodes is achieved using copper electroplating. For workpieces, the 'P20' material is used as it is widely used as a workpiece in injection mold industries. Current, Pulse ON Time, and Gap voltage are chosen as input parameters at three levels., viz. low, medium, high levels to study the output responses, the MRR, TWR, and Surface Roughness. Response Surface Methodology (RSM) and Gray Relational Analysis (GRA) are used to achieve single-level and multi-level optimization, respectively. The study showed that all three input parameters have a significant role on the output responses. Analysis of variance revealed that, current has highest contribution on MRR while, pulse on time has significant effect on tool wear rate. The comparative study of these tools revealed that the FDM-printed electrodes performed well without showing any type of tool failure and can be used in rough machining for critical geometries.

Key words:

EDM, FDM, GRA, P-20, Rapid Prototyping, RSM

Robotics in Medical Surgery

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Abstract:--

In the broad objective of AI's current real-world goals, machine learning healthcare features seem to achieve the goal for the past few years. In conformity to an article by Economic Times, India in 2019 has a shortage of 600,000 doctors and 2 million medical and nurses. There is also an inadequacy of suitably trained staff. In India, there is a doctor for every 10,189 individuals. WHO (World Health Organization) advises a proportion of 1:1,000, evidence a deficit of 600,000 doctors; and the nurse-patient proportion is 1:483, evidence a shortage of 2,000,000 nurses. This is where machine learning set foot. It can be evolved for health care services, that have the potential to change the diagnosis and dealing with diseases and also promising the patients that they would get the right treatment at an ideal time. The prediction is that this development can be used to help doctors and patients fit on better medications. These inventions will give relief, helping care specialists examine significant signals in vast data that would anyhow or another stay covered up. Future applications of machine learning in the surgical domain are distinct and remit multiple points along the surgical scope incorporating training, operations and, clinical data management. The utilization of robotics in surgery has firmly extended since it began in the decades. In contradiction, meshing with the artificial intelligence in this category is quite upright.

Keywords:

Doctor, Robots, Surgery, Medic

Chest X-Ray Diagnosis with Deep Learning

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Dr. V. K. Harpale, Electronics and Telecommunication Pimpri Chinchwad College of Engineering, Pune, India

Abstract:--

The application of Artificial Intelligence is growing rapidly in the field of medicine for the purpose of diagnosis as well as prognosis. Artificial Intelligence algorithms are data hungry and their performance is greatly affected by the size and type of the dataset used for training. Unlike other sectors, in medicine it is difficult to find a large dataset associated particularly with a specific health condition, therefore making it inconvenient to obtain accurate and reliable results. Some key challenges like data leakage, class imbalance and multi-label challenge, dealing with small size dataset, selection of appropriate CNN architecture needs to be taken into consideration while working with medical dataset. In this paper, a neural network is trained to classify an input chest x-ray image into one of the four disease classes namely Cardiomegaly, Edema, Mass and Pneumothorax. The algorithm outputs the probability of four diseases in the chest x-ray image. The key challenges and their possible solutions are addressed.

Index Terms

Deep learning, chest x-ray, class imbalance, cardiomegaly, mass, edema, pneumothorax, data leakage, pre- processing, small dataset size, CNN architectures

Correlation of Friction Stir Processing on Aluminium-Magnesium Alloy

A V Goutham Rao, Student
Vinay P, Assistant Professor

Abstract:--

Friction Stir Processing (FSP) is a strategy dependent on the guideline of Friction Stir Welding (FSW) to improve the mechanical properties. This work gives the Correlation between the process parameters rotational speed, transverse speed and axial force to foresee the response of the mechanical properties of friction processed of Al-Mg alloy yield strength, tensile strength and microhardness. The effects of process parameters on the resulting microstructure and mechanical properties are investigated. The results show that FSP produces very fine and homogenous grain structure, and it is observed that smaller grain size structure is obtained at lower rotational speeds. It is also observed that the hardness of the processed sheet depends strongly on the rotational and translational speeds and varies widely within the processed region. A center composite plan with three factors, each factor with three levels was utilized and a response surface methodology was applied to build up the regression models to foresee the responses. Technique of Analysis of Variance (ANOVA) was applied to sort out the process parameters that have impact on the responses. These outcomes bring up that the friction stir processed Al-Mg alloy with 1200 rpm rotational speed, 50mm-1 welding speed and 4kN axial force, have the greatest anticipated responses utilizing response surface methodology (RSM).

Index Terms

Friction Stir Processing, Mathematical Model, Anova

Impact on Underground Water Quality in Rural Part of Eastern Metropolitan Region of Pune Due to Highly Polluted Mula-Mutha River: Study along the Banks of River

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Abstract:--

The potable ground water quality is at risk due to contamination by pollution, sewage, industrial effluents along the nearby areas of Mula-Mutha river banks in rural part of eastern metropolitan region of Pune. Physicochemical and microbiological assessment of underground water sites near the banks of river to understand the impact of water contamination in underground water quality was done by standard methods. The physicochemical properties showed increase in hardness, elevated total dissolved solids (TDS) and conductivity for bore well samples. Unacceptable chemical oxygen demand (COD) and dissolved oxygen (DO) values were observed only at surface water and did not affected the underground water. Microbiological studies showed contamination of the underground water samples. There was definite presence of total coliforms and random presence of E coli. These studies indicate necessity to pre-treat the hard water samples of bore well and further disinfect the water before using for drinking purpose.

Index Terms

Contamination, ground water, mula-mutha, physicochemical assessment, potable water

Reinforcement Learning Based Visual Gaze Behaviour Tracking

Deepalakshmi.M
Dr.Amudha J

Abstract:--

In video established eye tracking methods, there are both mechanical and electrical based approaches existing. To examine the potential difference occurring in the eye, the electronic approaches deploys skin electrodes and the contact lenses are employed in case of mechanical methods. These techniques are found to be invasive in nature and for visual attention behavior analysis applications, these invasive eye tracking system is not applicable. Hence the non-invasive eye tracking could be developed by determining the point of gaze based on the observed image processing techniques. Some of the prevailing techniques include artificial intelligence, deep learning, and reinforcement learning and so on. Though several research works has been admitted in this research area, there are several challenges existing so far. The suggested learning techniques are found to be computationally complex and time consuming. This current research work intends to propose a deep convolutional reinforced learning model for predicting the visual attention behaviour of a person over dynamic scenes.

Keywords

artificial intelligence, gaze points, invasive eye tracking, deep learning reinforcement learning.

Stock Price Prediction Using Machine Learning

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Abstract:--

Nowadays, a vast array of data is readily ac- cessible. As a result, analyzing this data in order to derive any valuable information and developing an algorithm based on this research is critical. Data processing and machine learning can be used to do this. Machine learning is a subset of artificial intelligence that is used to create algorithms based on data patterns and historical data relationships. Machine learning is used in a variety of areas, including bio informatics, intrusion detection, information processing, gaming, marketing, malware detection, and image de convolution The aim of Stock Market Prediction is to forecast the potential value of a company's financial stocks. The use of machine learning, which makes forecasts based on the values of current stock market indices by training on their previous values, is a new development in stock market pre- diction technology. Machine learning makes use of a variety of models to make accurate predictions. The paper focuses on market valuation prediction using regression and LSTM-based machine learning. Open, near, medium, large, and volume are all factors to remember.

Effect of Liquid Nitriding Treatment on Electrochemical Behavior of Aisi 4140 Steel in Neutral Medium

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Abstract:--

Medium carbon AISI 4140 steel samples were liquid nitrided and characterized using scanning electron microscopy, micro hardness tester and electrochemical polarization. The thickness of the compound layer was found 3-5 microns and total case depth ~ 160 microns. Surface Hardness was found to be 536 HV and core hardness 315 HV. Microporosity observed in the compound layer can be attributed to an excess proportion of ammonia in the salt bath composition and low conductivity of the nitrides. Shift in potential in from –640.6mV for the untreated steel to - 476 mV for the treated steel was due to the formation of the inert outer surface of the nitrided layer and low conductivity of the nitrides. The corrosion rate was found to be 1.36mpy which is about 38% lower than that of untreated steel. However, due to the porous nature of the white layer, the steel will not able to exhibit long term corrosion resistance in neutral medium. Post oxidation should be carried out to enhance electrochemical properties.

Index Terms

Alloy steel, liquid nitriding, compound layer, corrosion resistance

Mathematical Modelling of Galvanic Corrosion: A Review

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Abstract:--

Galvanic corrosion is an electrochemical process in which two dissimilar metals under the presence of an electrolyte leads to the formation of a galvanic couple, causing one of the metals to corrode. It can significantly affect the life of fasteners and dissimilar metal joints. Mathematical modelling is one of the modern methods of engineering analysis of materials. The finite element method (FEM), and boundary element methods prescribed in numerical computation can prove to be highly beneficial in corrosion research. In this paper an attempt has been made to review the literature that use FEM, and BEM methods to study galvanic corrosion. This study will help researchers create a model using the governing equations and the boundary conditions associated with galvanic corrosion to obtain results that are in agreement with the outcomes achieved from investigational methods.

Index Terms

BEM/FEM, Galvanic Corrosion, Mathematical Modelling

ZnO/TiO_2 nanocomposite as a pigment for corrosion protection of low carbon steel

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Abstract:--

Nanocomposite of Zinc oxide (wurtzite) and Titanium dioxide (Anatase) was prepared using solid-state reaction at 9000C and used as a pigment in an epoxy matrix to prepare paint coating. The prepared composites were characterized using Scanning electron microscopy (SEM), X-ray diffraction (XRD), and energy dispersive spectroscopy (EDS) to study average particle size, nature of composite, phases present in the composite, and composition, respectively. The epoxy-based paint containing zinc oxide (ZnO)/ titanium dioxide (TiO_2) composite pigment was applied on low-carbon steel samples. Corrosion protection performance of the painted low-carbon steel samples in 3.5 mass % sodium chloride solution was evaluated using electrochemical technique. X-ray diffraction revealed the formation of zinc titanium oxide (Zn_2TiO_4) after calcination of composite at 900^0C. The corrosion rate of the zinc oxide (ZnO)/ titanium dioxide (TiO_2) nanocomposite painted low carbon steel was found to be 0.05 mpy as compare to 9.8 mpy of uncoated low carbon steel. The study reveals the possibility of using ZnO/TiO_2 nanocomposite as a pigment for corrosion protection.

Index Terms

Corrosion protection, electrochemical technique, low carbon steel, nanocomposites

Modelling of new Power Supply for Microwave based Wireless Power Transfer System using PV system

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Abstract:--

This work deals with the effect of integration of a Solar PV generation system with Microwave based Wireless Power System (WPS) or Microwave power transfer system (MPTS). The microwave generator i.e. Magnetron (used here) is fed with a DC power supply by using Solar PV generation system. A simulation prototype is designed to feed MPTS system with Solar PV array. Electrical modelling using SIMULINK/MATLAB is done and the output results are observed. The results obtained shows that Solar PV can be successfully integrated with WPS or MPTS for standalone applications or low power long range applications like charging of low power batteries via wireless system considering the practical optimizations. Here ideal Solar PV array with standard irradiance and cell temperature is used. The parameters considered in the prototype are ideal and the paper mainly focuses on the voltage and power input at the magnetron end i.e. source of MPTS. Along with modelling of simulink model of the power supply of magnetron different MPPT techniques are used to compare the outputs and which technique offers better results at the inputs of the transmitter block.

Keywords:

Solar PV system, MPPT techniques, P&O, Fuzzy logic, Wireless Power Transfer, Antenna, Microwave Power Transfer, Magnetron, Rectenna block.

Identify And Forecast Country Index Based On World Bank Data By Using AHP And TOPSIS Methodology's

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Abstract:--

This paper states the Conceptual hierarchy of world development indicators in World Bank data which represents the relationship between various indicators in a hierarchical form. A multi-level hierarchy (conceptual relationship knowledge) can be generated from a set of a questionnaire survey of World Bank data by applying indicator analysis and decision tree induction techniques. Most Contributing Indicators for Country Worth of each country can Identify using a qualitative and quantitative statistical method using Analytical Hierarchical Process (AHP) and Pareto's Law.

There are some methods for solving Multiple Criteria Decision-Making problems, of which one is the TOPSIS method. In TOPSIS criteria taken are 127 most contributing factors which analysed using Pareto's rule and their consistency checked using the analytic hierarchy process (AHP). And after applying TOPSIS on those 127 most contributing indicators the Country index calculated which tell us about the Worth of any country.

The most contributed World development indicators, which indicate about country worth, were identified then applying various time series analysis method study the behaviour of country worth is calculated. And by studying the behaviour of country index, as per variation of time then it is possible to apply different forecasting method on it. TOPSIS is applied to this forecasted data country Index(Country Worth) to predict for next some of year

Key Words :

World Bank Data; World Development Indicators; Hierarchy; AHP weightage; Pareto's Law; Normalized Weightage; TOPSIS; Country Index; Forecast;

Waste as Additives to the Manufacture of Fire Clay Bricks: A Review

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Abstract:--

Fire clay bricks are major construction entity, which has been an integral part of building, pavements, towers, bridges and other constructions. They are made since time immemorial through baking of cuboid shaped moulded plastic green mix at elevated temperature. The material has undergone change from a load-bearing body to a filler material now and attempts are now made to utilize various disposable waste from industry, agriculture, household and other domains, as fillers to the green mix of fire-clay brick. This article presents a review of some of the significant additives, like coal, wheat husk, straw, sugarcane baggage, rice husk, orange peel, groundnut shell ash, paper waste, plastic, ceramics, glass, textile waste, sludge, coir, paint waste etc to the fire clay bricks and their influence on the main properties of bricks, as compared to a reference bricks without any additives. Such attempts encourages disposal of waste on one side and enhances volume of production of bricks on other side.

Keywords:

Brick, Waste, Disposal, Compressive Strength, Water absorption, Sludge

Fast Tempering of Low Carbon Low Alloy Steel

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Abstract:--

The mechanical properties like tensile strength, ductility, hardness and toughness plays an important role in many applications of steel. However, improvement in combination of mechanical properties like tensile strength and ductility is difficult to achieve. In this work concept of tempering with fast heating rate was investigated to improve tensile strength as well as ductility and toughness for low carbon low alloy steel. Steel rods of 20MnCr5 of 8 mm diameter and 300 mm in length were subjected to tempering with two fast heating rates (85^{o}C/s and 180^{o}C/s) followed by fast cooling with zero holding time. Two tempering temperatures namely 315^{o}C, 425^{o}C were used. For the purpose of comparison, conventional tempering with two hours of holding time was also performed at these two tempering temperatures. Specimens were subjected to hardness and tensile test for estimation of YS, UTS, ductility and toughness. Specimens were also characterized by electron microscopy as well as XRD. Results showed that tempering with fast heating rates produced higher YS, UTS along with higher ductility and toughness as compare to conventional tempering. Tempering with fast heating rate improved product of UTS and ductility by 41 % and 43 % for tempering temperature 315^{o}C, 425^{o}C respectively.

Index Terms

Fast tempering, Toughness, Lath martensite, Low carbon low alloy steel, Cementite.

Design and Analysis of SEPIC Converter using Fractional Order Control Technique for Photovoltaic Applications

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Abstract:--

With recent developments, solar energy systems are easily available for industrial and domestic use with the added advantage of minimum maintenance. Groups of PV cells are electrically configured into n-modules and arrays to power any number of electrical loads. However, the energy produced by PV array exhibits non-linear V-I characteristics hence direct connection to the load or utility grid leads to poor output and reduced overall efficiency. Hence DC-DC converters are necessary to boost the output voltage generated from PV array to increase the efficiency of the system and also help in the tracking of maximum power point due to its broad tracking range. This paper analyses a SEPIC converter based on fractional order techniques to increase the output voltage and improve overall efficiency of PV system. P and O is used as a maximum power point tracking (MPPT) algorithm which controls the duty cycle of fractional order SEPIC converter. The fractional model of SEPIC converter is realized using fractional capacitors and fractional inductors. The design and implementation of PV array based on a SEPIC converter using fractional control technique is done in MATLAB/SIMULINK environment. The simulated results are compared with Integer order SEPIC converter.

Key Words:

SEPIC, Fractional Order Control, Photovoltaic (PV), Maximum Power Point Tracking (MPPT), Perturb and Observe (PO)

Design, Implementation and Management of E-Commerce Site for Online Shopping

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Abstract:--

Paper is about to develop an E-commerce website where mobile phones its accessories, computer, and its accessories and other electronic appliances will sale online by the project website, so development management and controlling of the website is in the project. And for developing managing and controlling projects Btrix24 software is used. Btrix24 is free and open-source software. The objective of this project is to develop a basic website where a consumer is provided with a shopping cart application and also to know about the technologies used to develop such an application. To develop project website Development of PMP (Project management plan) Initiate, execute manage and control the project and at the end termination of the project.

Index Terms

PMP, Project Schedule, SLDC, Project Module.

FEM based study for estimation of applanation Force during Tonometry

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Abstract:--

This work is focused on the construction of BIO- CAD modelling by using ANSYS software and analysis of human eye to satisfy its mechanical characteristics. The eye model is constructed to estimate the force of applanation securely exercised on the cornea during tonometry. Simulation is carried out with the ICARE tonometer where the deformation of cornea along the direction of cornea towards sclera is varied from 0.5mm-0.7mm for a constant value of IOP of eye to find the correlation between force of applanation on deformation of cornea.

Keywords

ANSYS, tonometry, Intraocular Pressure, ICARE, applanation

Scrumban: An Agile Framework for E-Commerce Development

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Abstract:--

In order to be competitive in today's fast-moving market, IT firms must be able to adapt quickly to action for the purpose of maintaining a high level of productivity in every aspect of their business. This research has been to improve the existing e-commerce software development is a process by which a company is using in order to solve the problems of its development on the basis of the Scrum framework. The qualitative method was used in the present study, in which the information is to be collected from the 3 to the parties involved in the project. The stakeholders are going to be a part of the interviews, and discussions about the current state of analysis of the scrum framework. With the help of an analysis of the current situation, as well as interviews with a new one, a process that is carried out on the basis of the Scrumban framework. Scrum-ban is doing is a good process flow, Scrum, which is the right approach, the Scrum-ban, also contains a number of large-scale projects in Kanban.

Keywords

Scrum, Kanban, Scrumban , Agile methodology, Project management.

Obstacle Detection using LIDAR

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Abstract:--

Obstacle Detection is one of the primary tasks for Autonomous Vehicle. A number of sensor systems are available for obstacle detection. One kind of such sensor system is LIDAR (Light Detection and Ranging) system known for its high accuracy in measuring distances. LIDAR is commonly used to make high-resolution 2D/3D map of the environment. This project uses RPLIDAR A1 Sensor is mounted on the top of the vehicle. RPLIDAR A1 Sensor is 360 degree 2D Laser Scanner (LIDAR) Sensor detects the obstacles within 6 meter range. Point cloud output from the RPLIDAR sensor provides the necessary data for robot software to determine where obstacles exist in the environment and where the robot is located related to those obstacles. hector_slam contains ROS (Robot Operating System) packages related to performing real-time SLAM (Simultaneous Localization and Mapping). In other words using information from RPLIDAR A1, hector_slam built a map of environment and show detected obstacles and where vehicle is located related to the map. Also, this vehicle uses two Laser Sensors for its movements. Laser sensors are attached in front of the vehicle. One is on Left side and another is on Right side of the vehicle. Laser Sensors detect obstacles and they avoid collision with the obstacles.

Index terms

RPLIDAR, Laser Sensor, ROS, SLAM, Raspberry Pi, Arduino.

Smart Irrigation System with ML.

Well-balanced irrigation system used for agriculture, supported by machine learning, and real-time sensor data

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Abstract:--

Presently, saving natural assets is an increasing number of a subject, and water shortage is a reality that Has been occurring in greater areas of the globe. One of the main techniques used to counter this fashion is the use of latest technologies. In this subject matter, the internet of factors has been highlighted, with these Answers being characterised by means of supplying robustness and ease, whilst being low fee. This paper Gives the study and improvement of an automatic irrigation smart system for agricultural fields .The evolved solution had a wireless sensors and actuators community, a cellular utility that gives The user capability of consulting now not simplest the information accumulated in actual time however also their history and Also, act according to the records it analyses. To confirm the water management, device mastering Algorithms have been studied to expect the first-rate time of day for water administration. Of the studied Algorithms (decision trees, random woodland, neural networks, and guide vectors machines) the One that obtained the satisfactory effects became a random wooded area, imparting an accuracy of 84. 6%. Except the ML answer, a technique changed into also developed to calculate the amount of water had to control the Fields under evaluation. Via the implementation of the system, it become viable to comprehend that the developed solution is effective and can gain up to 60% of water savings.

Keywords:

Smart Irrigation, ML, IOT, Smart Farming

Effect of Yogic Intervention on Stress in Working Professionals: A Clinical Study

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Abstract:--

Yoga, an ancient technique redefined by Patanjali, was earlier used by our ancestors to serve the best interests of mind, body and soul. However, recently it is used as an alternative therapy to solve health problems. A few medical practitioners even use it as a mainstream practice. Researchers have been exploring the possibility of adding it to mainstream in healthcare which is possible only with a clinical justification to prove its capabilities. It is believed to be helping patients reduce their stress levels and a clinical research was conducted to test the same. This paper discusses the potential of holistic practice of Ashtanga yoga (8 Limbs of Yoga) as per Patanjali's - Yoga sutra, in combating stress through exploration of clinical data.

Keywords

Stress, Yoga Sutra, Experimental design, Patanjali, Ashtanga Yoga.

Comparison of Agile and Waterfall Method in Website Project management

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Abstract:--

There are many project management methodologies which can be selected while starting new projects. The purpose of this paper is to compare most popular methodology Agile and Waterfall. This paper will determine which is the most suitable for a website development project.

Every project is different and requires to be handled differently. Hence, it is better not to grip on one particular methodology. conclude that there is no best methodology when it comes to select the methodology for a website project, a numerous factor needs to be accounted while choosing methodology to go with. Waterfall will be a better solution for small projects that have well-defined requirements that will not change, while Agile is preferred when continuous delivery & feedback are important.

Key words:

Waterfall, Agile, Waterfall Method, Agile Method, Agile Methodology, Waterfall Methodology

A Case Study on Cognitive Radio Wireless Network Simulation

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Abstract:--

Simulation of a wireless network is an important area of research. Many researchers are working on new wireless technologies and testing their new applications, protocols, etc through simulation. In [1], system model is modified for MAC protocol behaviour considering saturated as well as unsaturated traffic environment. A thorough simulation study is implemented to calculate different specifications like channel capacity, throughput and delay to investigate both non-game theoretic and game theoretical approaches. This study was carried out using discrete simulation tool, especially NS-2/3. Experience of working on such tool brings lots of hindsight about the simulation work. In this paper multiple case studies are presented to showcase the learning. Moreover, how to tackle these challenges have also been discussed.

Key words

Cognitive Radio, MAC Protocol Simulation Modelling, Performance analysis.

The Role of Information Technology (IT) in the Management of Interactive Classroom Community Learning Initiatives (ICCLI) for a Grade 4 class in a selected Intermediate Phase in Amajuba District: Surviving the Learning Communities

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Abstract:--

The paper sought to identify perennial technological strategies that might alleviate the management of interactive classroom community learning initiatives that can counteract the blurring principalities towards learner attainment and learner performance at their best potential in a Grade 4 classroom. In this regard, the major contention of the paper was of poor academic performance by Grade 4 learners which seemed to be attributed to impromptu phase transition and insufficient preparation on the part of transitional facilitation of learners from the foundation phase to the intermediate phase. The paper theorised and formulated a community-based interactive teaching strategy through the use of information technological tools, where parents, community and immediate stakeholders with various teaching and learning resources, came together to collaboratively enhance learners' levels of competence and achievement in their best potential through the availability of information technology (IT). Critical social capital (CSC) was used, for its mutualistic principles, as a theoretical framework (Bourdieu 1986:118); and the empirical data generated through participatory action research (PAR) as a data collection approach. McTaggart (2015:317) viewed PAR as an approach embedded in participative community involvement and action. The empirically generated data was deeply analysed using critical discourse analysis (CDA), which Van Dijk (2003:256) interpreted and discussed as having an intention to develop, and contribute in the analysis of text, level of power and social habits, while at the same time, demystifying the interaction between the classroom and the community, and equally improve the subject performance of learners in that class significantly. The socially inclusive interactive classroom community learning initiatives, as a strategy, apprehended that learners were expected to demonstrate basic operational knowledge and that a socially inclusive way of teaching and learning comprised of a wide applicability in learner performance. Inadequate interactive classroom-community learning initiatives result in ineffective communication as teachers often find it challenging to work together with detached communities which blurred learners' independency in logical application of thoughts. A lack in effective everyday communal engagement in learning; and low level of community involvement promoted low levels of learner achievement. Such inadequacies resulted in a negative impact on learners' learning attainment, forcing inability for learners to equally participate in their learning activities. Creation and sustaining an IT-driven community initiatives lured to incite fair resourcing strategies to promote equal access and opportunity to relevant information. Parent and community involvement enhanced network through mediation and development of space for equality, which insisted the involvement and understanding of the contexts within which such an interactive classroom community learning initiatives, as a strategy, might successfully be implemented.

In conclusion, the paper argued on socially inclusive teaching strategy that never tarry or reside in an individual, but in collective and collaborative relationships; to anyone who might be affected by any decision or action taken in an institution earning engagement and involvement. The research paper offered a strategy that responded to non-attainment problems in a socially inclusive manner by examining the role of IT as an extended limb to the teaching and learning strategy in the Grade 4 class.

Key words/concepts: Learning Initiatives, Learning Communities, Inclusive Education, Social Cohesion, Classroom Community, management, Information Technology

Baby Monitoring System using Arduino

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Abstract:--

In this paper, we have proposed a non-contact-based baby monitoring system using image processing. This system is used for the safety of a baby by their parents who doesn't present with their baby all the time. If any unusual action occurs, then the system provided here will send a message to the user or parents in the form of image of their baby and the text message. This project is based on the wireless communication based on the IOT technology which completely measures all the parameter which defines the health condition of the baby. The parameters which define health of the baby are Body temperature, moisture, pulse rate. This system gives certain assurance of correct knowledge to those who loved ones when they are away from their infant. Communication is done by internet which is easily available thing. This project presents a baby monitoring system for busy parents so that they can ensure the proper care and safety of their babies. This system can detect the baby's motion and sound; especially crying and video output of baby's present position can be displayed on a display monitor so that the mother or another responsible person can watch the baby while away from him or her. This baby monitoring system is capable of detecting motion and crying condition of the baby automatically. The Raspberry Pi B+ module is used to make the total control system of the hardware, condenser MIC is used to detect baby's crying, PIR motion sensor is incorporated to detect baby's movement and Pi camera is used to capture the baby's motion. A display is used to have video output of sleeping baby. Finally, the developed hardware is tested to analysis the capability of detecting the motion and crying sound of baby as well as the video output. This proposed system can provide an easier and convenient way for busy parents in terms of taking care of their babies.

Index Terms

baby monitoring, arduino, bluetooth, moisture, heartbeat

Geopolymer Concrete-Futuristic Construction Material: A Review

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Abstract:--

Concrete is the second widest material used all over the world. For preparing the concrete, Ordinary Portland cement is fundamental ingredient which act as a binder for concrete. Mass Production of cement causes CO2 emission which is responsible for global warming. There is need to ascertain the environmental friendly material that can be used as binder for concrete. Geopolymer concrete is futuristic construction material which is formed by using trash materials from industries like Fly-ash, rice husk ash and its binding properties are activated by geopolymerization process. Geopolymerization is process of forming a binding material by chemical reaction of alkaline activator (liquid or dry form) and Aluminosilicate materials. This process requires high temperature curing which give limitation for its use. This review study aims to summarized the research work done on formation of geopolymer concrete using different raw materials and alkaline activator in liquid or dry form for temperature curing and ambient curing. The conclusions of this review will specify the feasibility of various source materials and alkaline activators to produce the maximum strength with temperature curing and ambient. Review will also indicate the research gap to obtain the ambient cured green geopolymer concrete with various source materials.

A new whole smoke exposure system to mimic exhaled Cigarette Smoke induced histopathological and haematological alterations in mice Lungs

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Abstract:--

Background: ETS is a now a widely acknowledged danger to health of all animals including human beings. ETS can exacerbates many health conditions like asthma, respiratory infections and cancer. Cigarette wastes and cigarette smoke itself can have a major impact on the respiratory and social environment. However ETS is less frequently viewed in terms of environmental and social health. Environmental tobacco smoke (ETS) is a smoke that enters into the air from burning of tobacco products such as cigarette and exhalation of smoke by smokers and can act as carcinogen.
Objective: Research focused on finding the effects of passive smoking (also known as exposure to secondhand smoke or ETS) on the respiratory system of balb/c mice.
Methodology: In brief, side stream smoke was generated by burning cigarettes in specially designed smoking chamber and mice were exposed to this smoke. A new model of cigarette smoke chamber with low cost and easy confection for mimicking second hand smoke was developed for this study in our lab.
Results: In present investigation, histopathological results showed that oxidative stress and inflammation can be induced by cigarette second hand smoke in lung tissue.
Conclusion: Our study supported the fact that CS reduced host immunity and makes smoke exposed mice more prone to infections as compared to non-exposed mice. By choosing to smoke we are choosing to support this environmental as well as health damage.

Key words:

ETS, oxidative stress, carcinogen

Optimization of Fractional Order Chaotic Systems

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Abstract:--

Identifying the parameters of fractional-order chaotic systems (FOCS) is an essential issue in the process of synchronizing and controlling chaos. Given paper uses several metaheuristic optimization algorithms to estimate the parameters and orders of FOCS. The system which is used here is Fractional Order Volta System. The algorithms used are GWO (Gray Wolf Optimization), ALO (Ant-Lion Optimization), WOA (Whale Optimization Algorithm) and FPA (Flower Pollination Algorithm). The proposed algorithm is applied to several objective functions to identify FOCS parameters including Mean Square Error (MSE) and Integrated Squared Error (ISE). A comparison is made between the results obtained by each algorithm on each objective function used. The goal is to study the most suitable optimization technique in this difficult multidimensional problem and the best objective function that helps the algorithms to capture more precise and consistent results.

Compressive Strength of Concrete Using Model Tree and Support Vector Regression: A Comparative Assessment

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Preeti Kulkarni, Assoc. Professor, Vishwakrma Institute of Information Technology, Pune

Abstract:--

Data Driven Techniques has lately gained attention from the Civil Engineering Industry. Many applications of various Data Driven Tools can be visualized in the area of Concrete Technology, Hydrology etc. Concrete Mix is accepted or rejected depending on the Compressive strength of the same. However, to ascertain the same it demands time and materials. To overcome this limitation Data Driven Techniques like Model Tree (MT) and Support Vector Regression (SVR) were utilized in the current project. Two different models were developed each utilizing MT and SVR to predict the concrete Strength at various ages with proportions of materials and age of curing as input parameters. The performance of model developed using MT is better as compared to SVR. MT technique is characterized by output in terms of series of equations which can be readily used, on the other hand the support vectors with various kernels display output in terms of Weights and/or vectors which can further be utilized for prediction.

Index Terms

Model Tree, Strength, Support Vector Regression

Developing a new laser cladded Ti-15%Mo layer on 316L stainless steel as a potential superior wear-resistant coating for biomedical implant applications

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Abstract:--

Biomaterials used in biomedical implants includes 316L stainless steel, titanium based alloys, and cobalt-chromium based alloys, depending on the application. These biomedical implants have failed to demonstrate high wear resistance which may causes release of harmful metal ions in the human body. So, wear resistance is an important attribute to consider when choosing a biomaterial. Recently, metastable β Ti alloys (Ti-15%Mo) are widely projected for manufacturing the next generation of biomedical implants. In this research, Ti-15%Mo β phase alloy was laser cladded on 316L stainless steel which is relatively low cost biomaterial to improve surface properties and to give long service implant application. The cladded and uncladded layers were characterized using optical microscopy, scanning electron microscopy (SEM), X-ray difractometry (XRD) and micro- hardness measurements. Later, the wear rates in simulated body fluids (SBF) hank's solution and in dry condition were evaluated by using Pin-on disc test. The cross-sectional optical microstructures indicated a thin well-deposited coating and good adhered to the substrate. The micro-hardness values of the laser cladded surface coating was found to be 414 HV as compared to 241 HV for the as received 316L stainless steel substrate. The wear test findings showed that Ti-15%Mo cladded samples have superior wear resistance in both dry and Hank's solution conditions offers admirable performance implying longer implant service time.

Keywords:

Ti-Mo alloy, 316L stainless steel, Laser cladding, Wear resistance, Biomedical implant

Solar DC Domicile

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Abstract:--

This paper presents the circuitry modelling of the solar photovoltaic MPPT lead-acid battery charge controller for the standalone system in MATLAB/Simulink environment. A buck topology is utilized as a DC-DC converter for the charge controller implementation. The maximum power of the photovoltaic panel is tracked by the Perturb and Observe MPPT algorithm. The MPPT tracking performance is carried out in this paper. The performance result shows that theMPPT is capable to track to the PV panel maximum point at any solar irradiance variation within 0.5 seconds with maximum power tracking efficiency up to 99.9 %. This validated model contributes to a better sizing of PV panel and battery energy storage for the small and medium standalone PV system. This research also proposes novel solutions for utilizing the unavoidable solar system losses by the hypothesis of dispensing the power converters in residential solar system application, which is based on the matching between the source and load. Since the energy source is a direct current DC supply, the matching process has achieved throughout studying the normal alternative current AC appliances and its compatibility to be switched on DC supply, either by direct coupling or simple modification. The work investigates eliminating more than one of the main costly components that is used in the traditional solar powered home system, such as DC-AC Inverter and AC-DC converters. All the proposed system components were investigated in three stages; firstly, the proposed solar photovoltaic MPPT lead-acid battery charge controller stage, secondly and finally, the analysis and selection of the appliances power supply with respect to DC compatibility stage.These phases will be evaluated by using MATLAB/Simulink and verified with experimental data.

Index Terms

solar photovoltaic MPPT lead-acid battery charge controller, MATLAB/Simulink, matching techniques, 99.9%, DC-AC inverter, AC-DC converter, residential

Intrusion Detection Systems in the Internet of Things Environment

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Abstract:--

The Internet of Things (IoT) has been rapidly evolving towards making a greater impact on everyday life to large industrial systems. Unfortunately, this has attracted the attention of cybercriminals who made IoT a target of malicious activities, opening the door to a possible attack on the end nodes. To this end, Numerous IoT intrusion detection Systems (IDS) have been proposed in the literature to tackle attacks on the IoT ecosystem, which can be broadly classified based on detection technique, validation strategy, and deployment strategy. This survey paper presents a comprehensive review of contemporary IoT IDS and an overview of techniques, deployment Strategy, validation strategy and datasets that are commonly applied for building IDS. We also review how existing IoT IDS detect intrusive attacks and secure communications on the IoT. It also presents the classification of IoT attacks and discusses future research challenges to counter such IoT attacks to make IoT more secure. These purposes help IoT security researchers by uniting, contrasting, and compiling scattered research efforts. Consequently, we provide a unique IoT IDS taxonomy, which sheds light on IoT IDS techniques, their advantages and disadvantages, IoT attacks that exploit IoT communication systems, corresponding advanced IDS and detection capabilities to detect IoT attacks.

Keywords:

IOT, Network Security, Sensors, Machine Learning

Composite Concrete by using Cementitious Materials

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Abstract:--

The paper studies recent investigations for combining Pozzolanic materials like Metakaolin, Nano-Silica & GGBS on strength properties for concrete. It also studies the effect of Metakaolin, Colloidal Nano-Silica (CNS) & GGBS on Mechanical, Durability and porosity properties. Nano-technology is adopted for concrete production and has the capability of enhancing the performance of concrete. It was observed to improve the mechanical and durability properties of concrete which leads to utilization of new and sustainable materials. Though, the utilization of Nano-technology in concrete technology should proceed with the available local materials. One remarkable material to analyse is Nano silica obtained from silica sand. Past researches on concrete utilizing Nano silica has observed with better workability and strength. The utilization of Metakaolin as a few percent of substitution for the cement have some beneficial impacts on concrete performance. Broad research work in this field has been aimed to reduce the impact of cement industries on green-house gases either by increasing the efficiency of manufacturing processes or by utilizing supplementary cementitious material, which can substitute the cement to a partial amount. Different types of supplementary cementitious materials have been researched, those are fly ash, GGBS, natural pozzolans, and silica fume. Latest investigations demonstrated that the utilization of new technologies can bring the industrial break-through in the manufacturing of supplementary cementitious materials. Also, we can believe that Nano- technology is one of the most potential research areas that can have significant improvement in the mixture designs, similarly the performance and production of cementitious materials. A review for mechanical, Porosity & Durability properties is carried out in this paper.

Keywords:

Metakaolin, Nano-Silica, GGBS, Mechanical Strength, Durability, Porosity

Anthracnose Symptoms Detection on Mango Trees using Deep Learning

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Abstract:--

Fungal diseases not only influence the economic importance of the plants and its products, but also abate their ecological prominence. Mango tree, specifically the fruits and theleaves are highly affected by the fungal disease named as Anthracnose. The main aim of this article is to develop an appropriate and effective method for diagnosis of the disease and its symptoms, therefore espousing a suitable systemfor an early and cost-effective solution of this problem. Over the last few years, due to their higher performance capability in terms of computation and accuracy, computer vision, and deep learning methodologies have gained popularity in assorted fungal diseases classification. Therefore, for this work a Multilayer Convolutional Neural Network (MCNN) is proposed for the classification of the Mango leaves infected by the Anthracnose fungal disease. This work is validated on a real-time dataset captured at the Shri Mata Vaishno Devi University, Katra, J&K, India consists 1070 images of the Mango tree leaves. Dataset contains both healthy and infected leaf images. Results envisage the higher classification accuracy of the proposed MCNN model when compared to the other state-of-the-art approaches.

Index Terms

Convolutional neural network, Image classification, Plant pathology, Precision agriculture.

Effect of Curing Temperature on Flyash Based Geopolymer Concrete at Different Molarities

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Abstract:--

The demand of concrete is increasing day by day and Cement is used for satisfying the need of development of infrastructure facilities, cement production generates CO2, which adversely affect the environment. In order to reduce the use of OPC and CO2 generation, the new generation concrete has been developed such as Alkali Activated Concrete. Alkali Activated Concrete is cement less concrete, which uses Fly ash, GGBS, silica fume etc industrial by products as binding material .Present work selects fly ash to manufacture Alkali Activated Concrete. Alkaline Solutions are used for polymerization of the concrete. Polymerization can take place at high temperatures. Concrete should be oven Cured in the varying range of 60°C to 100°C for a period of 24 to 96 hours.

The objective of the present work is to study the effect of curing temperature and molarity on compressive strength of fly ash based Alkali Activated Concrete. Alkali Activated concrete with 8 and 10 Molarity cured at temperatures of 600C, 700C, 800C, 900C and 1000C. Fresh and hardened properties of the concrete are tested. Compressive strength is observed to increase with increase curing temperature.

IOT Based Agriculture Monitoring System

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Abstract:--

Recently we are facing a big problem of shortage of food because of comparatively low yields. Hence, this system becomes more important to grow crops in better way. IOT based Agriculture Monitoring System is the engineering approach in which the farmers within the rural areas are going to be benefitted by automatic monitoring and control of greenhouse environment. It'll replace the direct supervision of the human. The purpose of the system is to develop, monitor and control the parameters like temperature, humidity, and lack of water. It focuses on the Generic Architecture which may be applied for several other Automation Application. Due to urbanization and lack of land availability, this is an excellent way to construct the Automatic Greenhouse System which can be reserved mainly for growing crops. With this proposed system it is easy to regulate and monitor the multiple Greenhouses using IOT from the central location wirelessly with master and slave configuration using ESP32. One monitoring section is predicated on sensor unit and another section having controlling section alongside output devices like pump, sprinkler unit, lights. Overall system observed and controlled via mobile app built up with the assistance of thing speak server. This research paper resolves many issues of farmers like continuous monitoring of crops, with the help of totally automated system by using engineering approach even in farmer's absence for longer period of time

Keywords

IOT, Automatic Green House System, ESP32, Continuous monitoring, DC motor controlled Sprinkle

Text Induction and Construction of a Creative Text Classification Algorithm based on DIKW Model

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Abstract:--

Simple data analysis models cannot cope with these complex and diverse changes. Therefore, this paper proposed DIKW Model to support computer for improved understanding of text. There are many tasks in the NLP field, including word segmentation, text classification, text matching, topic modeling, sequence labeling, dependency syntax analysis, text generation, machine translation, reading comprehension, and dialogue systems. In order to obtain effective information in a timely and accurate manner in massive texts, text classification technology has attracted widespread attention and brought more applications and imagination to everyone. In the field of natural language processing, the most important thing to process massive text files is to extract the issues that users are most concerned about. Regardless of whether it is a long text or a short text, the theme of the entire text can often be spied through a few keywords. There are a variety of different scenarios and fields for text classification tasks. This paper gives a general discussion about the current status of text classification and presents a novel way to construct a Creative text classification algorithm based on DIKW Model.

Keywords

NLP, Creative Computing, DIKW Model, Text Classification Algorithm.

A BiLSTM Based Approach to Detecting SQL Injection Attacks

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Abstract:--

With a rapid development of web technology, security problems have become a critical issue for web applications. Among the web security vulnerabilities, SQL injection attacks are one of the most popular and threatening attacks. In this paper, we propose a new approach to applying the bidirectional long-short term memory network (BiLSTM) model in SQL injection detection. Meanwhile, an improved feature extraction method is presented as well. Firstly, the preprocessing stage is refined, including the improvement of word segmentation method and the atomization of lexical analysis mark and then the code is converted into a vector as the input of the neural network. Secondly, the abstraction of the SQL attack is learned in both directions using a two-way long and short-term memory network features. Finally, the Softmax classifier is used to classify the learned abstract features, and a dropout algorithm is used to avoid overfitting of the model. Experiments show that the detection precision and recall rate of the proposed method are as high as 98% on the SQL detection data set. Compared with the traditional machine learning method and deep learning method, the proposed method has better detection performance.

Keywords

SQL injection, Feature extraction, Machine learning, BiLSTM, Deep neural network.

Modifying Simple Evolving Connectionist System Parameters for Classifying Skin Cancer Images

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Abstract:--

Evolving Connectionist System (ECoS) is an evolved classifier that perform learning both online and offline. SECoS is a simplified ECoS that updates weight based on incoming data training. SECoS has been used for various classifier application. This paper focuses on skin cancer images classification by employing the weight update. The hidden layer is calculated by using a modified distance formula to reduce error in training. In order to ensure best classification, the mean absolute percentage error (MAPE) and modified-MAPE by using data rate are employed. The image classification has the lowest error when LR, learning rate 1 is set to 0.3, LR 2 is set to 0.3 threshold of sensitivity is 0.5, and threshold of error is 0.1.

Keywords

Classifier, ECoS, Modified MAPE, Cancer image

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