ICRTTD 2025

INTERNATIONAL CONFERENCE ON

RECENT TRENDS IN TECHNOLOGICAL DEVELOPMENT

(10th April 2025 to 11th April 2025)

THE BOOK OF ABSTRACT

(ISBN: 978-81-985543-6-9)

Organized By

PADMASHRI DR. VITTHALRAO VIKHE PATIL INSTITUTE OF TECHNOLOGY & ENGINEERING (POLYTECHNIC) LONI.

(Excellent Grade Institute & Best Campus Award (Polytechnic) in January 2019 by ISTE, New Delhi)

Five Departments are NBA Accredited

The

Book of Abstracts

ONLINE

International Conference

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TITLE: *Recent Trends in Technological Development 2025 (ICRTTD 25)*

The Book of Abstracts

Author/Editor:

Dr. Vijaykumar Rameshwar Rathi

Padmashri Dr. Vitthalrao Vikhe Patil Institute of Technology & Engineering (Polytechnic) Loni

Published By: Self-Published

Padmashri Dr. Vitthalrao Vikhe Patil Institute of Technology & Engineering (Polytechnic) Loni

***Publisher's address*:**

Padmashri Dr. Vitthalrao Vikhe Patil Institute of Technology & Engineering (Polytechnic) Loni
Tal: Rahata, Dist: Ahilya Nagar, Maharashtra (India) 413736
www.pravara.in/polytechnic

Printer's Details: Soft Copy (e-copy)

ISBN No.: 978-81-985543-6-9

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ABOUT THE CONFERENCE

ICRTTD 2025 is being organized with a view on technological impact to foster research in the field of Engineering and science to promote awareness what are recent developments. The conference will bring in eminent personalities from academics and industry, wherein they will come together and brain-storm for the purpose of holistic knowledge sharing. The objective is also to provide forum for preparation of latest documents, ideas and their applications for upcoming Post-graduate and Doctoral students as well.

MESSAGE FROM CEO

Dr. Sushmita Vikhe Patil
CEO, PRES,
Pravaranagar

Welcome to P.Dr.V.V. Patil Polytechnic. Our aim is to complement the curriculum of Technical education by integrating **"ICRTTD 2025"** with the awareness of self and the Technical. We strive to create a learning environment that elevates the collective consciousness of the community and inspires a sense of commitment towards mindful practices.

This is the land of **PRAVARA** where scholars from all over the world came and learned relentlessly for attainment and dissemination of knowledge. With such a rich legacy and history backing us, we at Pravara, have this hard responsibility of living up to this rich legacy and tradition. We are fortunate to be set up in the soil where Knowledge is the tradition; constant quest for the unknown is the quintessential strive. We are very confident of making a very significant contribution in creating a pool of effective leaders. ***PRAVARA*** – The ICRTTD 2025 at P.Dr.V.V. Patil Polytechnic, call upon the community to join us in this noble pursuit of cultivating and sharing an ecosystem of ICRTTD 2025, ***International Conference on RECENT TRENDS IN TECHNOLOGICAL DEVELOPMENT 2025*** is one such step to create a platform where students, researchers, and practitioners can discuss the scientific avenues of **ICRTTD 2025** in technical context. At a time, when the physical and mental wellbeing of an individual is of utmost importance, **ICRTTD 2025** is the way forward. Hence, let us all be here – for ourselves and for each other.

MESSAGE FROM PRINCIPAL

Dr. V. R. Rathi
Principal

It is with great pleasure and immense pride that I extend a warm welcome to all participants, scholars, and experts attending the "*International Conference on Recent Trends in Technological Development*" ***(ICRTTD 2025)***.

As we gather here today, the world stands at the threshold of a new era, driven by remarkable advances in technology that are reshaping industries, economies, and societies. This conference is an opportunity to deliver into these groundbreaking innovations, explore the latest trends, and exchange ideas that will continue to define the future of technology and its applications.

Technological advancements, be it in Artificial Intelligence, Machine Learning, Robotics, or Sustainable Development, are transforming how we live, work, and communicate. The themes discussed in this conference reflect the current and future needs of our globalized world, offering a platform to share knowledge and foster collaborations that will enable us to build a better, more connected world.

The dynamic exchange of ideas, insights, and perspectives during the sessions will not only inspire further research and innovation but also deepen our understanding of the potential that technology holds for addressing global challenges. As we explore these themes in depth, let us remember that our collective efforts can lead to meaningful solutions that will benefit society as a whole.

I commend all the researchers, speakers, and participants for their dedication and hard work, and I encourage everyone to take full advantage of this invaluable platform to network, learn, and engage in productive dialogue. I look forward to the outcomes of this conference, which I believe will contribute significantly to the advancement of knowledge and the realization of new possibilities in the realm of technological development.

Wishing you all an enriching and insightful experience at the conference!

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ICRTTD-25/CH/1

METHODS FOR SYNTHESIS AND APPLICATIONS FOR SYNTHETIC HYDROGEL – A REVIEW

Mrs. Kadu P. S.[*1] , Mr. Chavan N. B[*2] , Miss Dond S. R. [*3]

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[*3] *Assistant Professor, Ashok Polytechnic Ashoknagar.*

ABSTRACT

Hydrogels refer to polymeric networks that can absorb a significant amount of water into their gel structure. Hydrogel can absorb 90 % of water because of that this hydrogel is widely used in coal dewatering, food additive, pharmaceuticals, biomedical, diaper, agricultural, wound dressing and medical field. Hydrogel is assistance for easy drug and medicine delivery from one place to other place. Long service life hydrogel has a wide range of applications due to its high water absorption. Hydrogels can measure changes of pH, temperature and metabolite concentration. Hydrogels also have good transportation attributes and are easy to modify. Hydrogels also have suitable transport properties and easy getting modified and have maximum stability and durability environmentally sensitive hydrogels are capable to sense a change of pH, temperature, concentration of metabolite and release their load as the result of such a change. Hydrogels closely mimic natural living tissue more than any other class of synthetic biomaterials owing to their high-water content, the porous and soft texture. The skin is considered the largest organ of the human body, and drug delivery through this route is known as a transdermal drug delivery system.

Keywords: *Electro sensitive Hydrogel Synthesis, Acrylamide and Acrylic acid, Swelling ratio, AAm/AAc Monomer Ratio*

ICRTTD-25/MK/2

A REVIEW PAPER ON VOICE OPERATED LIFT CONTROL SYSTEM USING GSM MODEL

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ABSTRACT

The project introduces a Voice-Operated Lift Control System with a strong emphasis on efficiency and safety. Utilizing a PIC microcontroller and an array of sensors, including temperature sensors, the system enables voice-controlled elevator operation while prioritizing passenger safety. Sensors faults trigger immediate error responses, including motor halts .Auditory feedback is provided via an audio player module to enhance user experience.

Now a days we can find the large buildings, malls, hospitals in our area. The buildings have a more numbers of floor. This paper suits for handicap, paralysis People to move from one floor to another floor by using elevator. Main purpose of this paper is to design elevator wireless system with the help of android and Bluetooth and microcontroller concept.

Keywords: *Microcontroller 18F4520 , IR Sensor, DC Motor, 7 Segment Display, HC05 BLUETOOTH MODULE.*

ICRTTD-25/ME/3

IMPACT OF DIFFERENT PARAMETERS ON SPRINGBACK DURING COLD DRAWING OF SEAMLESS TUBES: A LITERATURE REVIEW

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ABSTRACT

Among the different processes of seamless tube manufacturing, cold drawing process is more popular among manufacturers because of its ease of manufacture. However, the process is subjected to various defects like, dimensional variation, scores, chattering, bending and springback. Springback is the most severe defect which causes deviation from designed target shape, downstream quality problems and assembly difficulties. This paper conducted literature survey of springback effect while cold drawing of seamless tubes. The paper mainly incorporated the literature survey related to the performance, analysis and modification to be done on land width and die angle in controlling the spring back of seamless steel tubes. This paper also proposes the research framework required to work on identified research gap.

Keywords: *Cold Drawing, Spring Back, Seamless Tubes.*

ICRTTD-25/ME/4

THE INTEGRATION OF IOT INTO ELECTRIC VEHICLES (EVS): A TRANSFORMATIVE DEVELOPMENT

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ABSTRACT

The integration of the Internet of Things (IoT) with Electric Vehicles (EVs) represents a transformative approach to enhancing the efficiency, safety, and sustainability of transportation systems. IoT-enabled EVs leverage interconnected sensors, real-time data processing, and advanced communication networks to deliver intelligent solutions for energy management, predictive maintenance, and driver assistance. This integration empowers seamless vehicle-to-everything (V2X) communication, facilitating dynamic interactions with charging stations, traffic infrastructure, and other vehicles. By optimizing battery performance, streamlining charging processes, and enabling over-the-air software updates, IoT enhances the reliability and convenience of EV ownership. Additionally, IoT contributes to reducing environmental impacts by supporting data-driven energy distribution and enabling smart grid integration. This abstract explores the technical innovations, potential challenges, and future implications of IoT in advancing the EV ecosystem, fostering a more connected and sustainable future for mobility.

Keywords: *Electric Vehicles; Internet Of Things (IOT);Charging Infrastructure;Emission Reduction.*

ICRTTD-25/MK/5

DESIGN AND ANALYSIS OF BATTERY MANAGEMENT SYSTEM FOR ELECTRIC VEHICLES

Prof. Kishor S. Dhore[1], Ms. Priti Ashokrao Kapse[2], Ms.Swati Tularam Pardhi[3] , Mr. Mohan Wasudeorao Raut[4]

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ABSTRACT

The capacity of a system for battery management (BMS) to evaluate the general condition of the battery pack is one of its most important features. The BMS monitors the capacity of the weakest cell and the internal resistance of each cell. Based on these variables, it calculates a cell healthiness percent that ranges from 0% to 100%. A fault code is created and freeze frame data is kept for later examination if any cells or the entire pack fall below the predetermined criteria when this health data is assessed against them. Numerous functions on the BMS are designed to protect the battery pack. These systems use techniques to make sure the battery lasts longer and is ready to give full power when needed, in addition to continuously monitoring and safeguarding it. The BMS extends the life of the battery pack and improves its performance by carefully controlling cycles of charging and discharging, balancing cell voltages, and guarding against situations that could harm the battery. This guarantees dependable operation and maximum efficiency.

Top of Form

Keywords: *State on charge (SOC), simulation, electric vehicles, batteries management systems, and open circuit value (OCV).*

EXPERIMENTAL STUDIES ON PERFORMANCE OF SINGLE SLOPE SOLAR STILL BY USING COPPER AS HEAT STORAGE MATERIAL SILICON FOIL AS A REFLECTOR

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ABSTRACT

Solar stills come in various varieties. A single basin solar still is one of the most basic solar energy devices that can be used to turn waste, brackish, or salted water into drinking or potable water. Materials that are easily obtained locally can be used to easily manufacture this device. It also requires minimal professional labor, and the maintenance is inexpensive. This may still be an effective way to address the issue with drinking water. Its low productivity makes it uncommon to utilize. A lot of work is done to increase the still's production. This article reviews the advances made in improving productivity through single-basin passive types. In order to minimize condensation loss and maximize radiation, the orientation and inclination are optimized. In the basin, in addition to water, various materials are added to increase the evaporation rate, heat capacity, and radiation absorption capacity. In order to enhance the effects of absorption, storage, and evaporation, silicon foil and a copper plate painted black are employed in the basin.

Keyword: *- Solar desalination; Single-basin solar stills; Passive solar stills; Experimental Analysis; Review.*

ICRTTD-25/CM/7

ADVANCING WEARABLE TECHNOLOGY THROUGH RASPBERRY PI INTEGRATION

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ABSTRACT

Nowadays, computers are essential in everyone's life. The computer is a portable electronic gadget that helps humans with their work. Everyone, from a student to an elderly person, is assigned a duty such as developing an application or creating a paper that requires the use of a computer. Similarly, mobile devices make work easier, but we cannot access or use the same software applications that we can on computers. To accomplish a task or work, we cannot access all applications on a mobile device and must use a computer. However, we cannot take our computers everywhere because a portable laptop has been produced. Increasing innovation decreases the size of computers from stationary to mobile, such as laptops. However, computers are big and require a bag to transport them. To address this issue, we created a device called "Wearable Computing with Temperatures and Lidar Sensor" that was inspired by wearable computing technologies. "Wearable Computer with Temperatures and Lidar Sensor" is a wearable device that functions as a computer, monitors the temperature of the person wearing it, and displays the distance between a person and an object. In everyday life, computers play a significant role. For that, we designed a gadget called "Wearable Processor with Temperatures and Lidar Sensor."

Keywords*-Raspberry pi controller, display screen, stylus, HDMI ports.*

ICRTTD-25/MK/8

ARTIFICIAL INTELLIGENCE IN MECHATRONICS

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ABSTRACT

The integration of Artificial Intelligence (AI) in Mechatronics has revolutionized the design, control, and optimization of intelligent systems. This paper explores the role of AI techniques, such as machine learning, deep learning, and neural networks, in enhancing the performance of mechatronic systems. The study highlights how AI-driven algorithms are utilized for predictive maintenance, autonomous decision-making, and real-time data analysis in robotics, industrial automation, and smart manufacturing. Furthermore, the paper discusses the impact of AI on adaptive control systems, sensor fusion, and human- machine interaction. The findings demonstrate that AI not only improves system efficiency and accuracy but also enables self-learning and self-optimization capabilities, paving the way for the next generation of intelligent mechatronic systems.

Keywords: *Mechatronics, artificial intelligence, machine learning, control systems, robotics, sensors, automation, predictive maintenance, optimization, and intelligent systems.*

ICRTTD-25/AE/9

A COMPREHENSIVE STUDY ON HYBRID ENERGY STORAGE SYSTEMS FOR SUSTAINABLE HYBRID ELECTRIC VEHICLES

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ABSTRACT

The shift toward sustainable transportation has accelerated the advancement of Hybrid Electric Vehicles (HEVs), with energy storage playing a vital role in enhancing their efficiency and performance. This research offers an in-depth examination of Hybrid Energy Storage Systems (HESS), which are designed to enhance the reliability, longevity, and energy management of HEVs. By combining multiple energy storage technologies, such as batteries and super capacitors, HESS leverages their complementary properties to optimize power delivery and energy recovery.

This study examines different Hybrid Energy Storage System (HESS) architectures, control methodologies, and energy management strategies aimed at maximizing efficiency and longevity. It highlights critical performance factors such as power density, energy density, and state-of-charge balancing, which play a key role in system optimization. Additionally, a comparative evaluation of various hybrid storage configurations is conducted to assess their effectiveness under dynamic driving conditions.

The research also explores advancements in power electronics and intelligent control approaches, including model predictive control and machine learning-based optimization, to enhance energy utilization. Moreover, it evaluates the environmental and economic implications of HESS integration in Hybrid Electric Vehicles (HEVs), considering lifecycle costs and sustainability aspects.

By incorporating renewable energy sources and ensuring compatibility with smart grids, HESS can significantly reduce carbon emissions and support the transition toward green mobility solutions. The findings offer valuable insights for automotive manufacturers, policymakers, and researchers in advancing HEV technology. Future directions focus on developing next-generation materials, intelligent energy distribution frameworks, and seamless integration with renewable energy systems to foster a more sustainable and energy-efficient transportation sector.

Keywords: *Hybrid Energy Storage Systems, Hybrid Electric Vehicles, Energy Management, Power Electronics, Sustainable Mobility*

MENSTRUAL PAIN RELIEF SYSTEM.

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ABSTRACT

Menstruation is a natural biological process that can bring both positive and challenging experiences. A considerable percentage of young women, around 30%, suffer from intense menstrual pain, often accompanied by symptoms like backaches, nausea, fatigue, headaches, and digestive discomfort. This condition, known as dysmenorrhea, is categorized into primary and secondary types. Primary dysmenorrhea is the most prevalent, affecting nearly 90% of adolescent females and over half of menstruating women worldwide. Among them, 10–20% experience severe pain that disrupts daily routines, academic performance, and recreational activities. To alleviate discomfort, individuals use a combination of self-care methods, including no pharmacological techniques such as rest, heat application, and exercise, as well as pharmacological solutions like over-the-counter pain relievers.

To offer an effective remedy, a menstrual pain relief system utilizing heat therapy and vibration therapy has been designed. This system features a lightweight, wearable device that delivers consistent and adjustable warmth to the lower abdominal area for targeted pain relief. It includes customizable temperature controls for enhanced comfort and safety, along with a rechargeable battery for portability and prolonged use. By applying controlled heat therapy and vibration therapy, the device helps relax uterine muscles, increase blood circulation, and reduce pain severity. This innovative approach aims to improve the quality of life for individuals experiencing menstrual discomfort, enabling them to engage in daily activities with greater ease and well-being.

ICRTTD-25/ME/11

A REVIEW PAPER ON A SMART VEHICLE FOR FARMING TASKS

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ABSTRACT

The main back bone idea of the project is to create a Equipment for Farmers which helps them to Sow Seeds and Spray Pesticide without any Human Interference. In the Agricultural Sector one of the main points of concern is the excess spraying of Pesticide in the fields which leads to several implications to Water bodies and Causes Pollution. The Vigorous process of Sowing Seeds in the fields is made easier by the Vehicle. We intend to introduce Fly Wheel Based Seed Sowing System and spraying of pesticide. The system is controlled by a State Of Art Arduino Control System. The User is given access to all the Capabilities of the Vehicle through an advanced Arduino connected via Bluetooth to an Android Application. Seed sowing system is provided with a tank to store the seeds. The system used in achieving the Seed Sower system is Very simple and easy.

Keywords: *Arduino Uno, Motor Driver, DC Motors, Bluetooth Module, Servomotor, Water pump*

ICRTTD-25/MK/12

PID BASED TEMPERATURE CONTROL USING LABVIEW

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ABSTRACT

Temperature control is a critical requirement in various industrial and research applications to ensure process stability, product quality, and energy efficiency. This project focuses on implementing a PID (Proportional-Integral-Derivative) based temperature control system using LabVIEW. The system utilizes a thermocouple or RTD (Resistance Temperature Detector) to measure temperature, a DAQ (Data Acquisition) module to interface with LabVIEW, and a heater as the actuating element.

LabVIEW, a graphical programming environment, is used to design and implement the PID control algorithm, allowing real-time temperature monitoring and control. The PID controller dynamically adjusts the heater power based on the difference between the setpoint and actual temperature, minimizing overshoot and steady-state error. The system is tested under different conditions to evaluate its response time, accuracy, and stability.

This project demonstrates the effectiveness of PID control in maintaining a desired temperature with minimal fluctuations. It has potential applications in industrial automation, biomedical systems, and HVAC (Heating, Ventilation, and Air Conditioning) systems.

ICRTTD-25/MK/13

SIMULTANEOUS LOCALIZATION AND MAPPING (SLAM) SIMULATION IN ROS USING GMAPPING AND HECTOR SLAM

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ABSTRACT

Simultaneous Localization and Mapping (SLAM) is a crucial technology for autonomous robots, enabling them to navigate and map unknown environments. This study focuses on the simulation and comparative analysis of two widely used 2D SLAM algorithms—GMapping and Hector SLAM—within the Robot Operating System (ROS) framework. GMapping, a particle filter-based approach, relies on odometry and LiDAR data, making it suitable for structured environments. In contrast, Hector SLAM operates without odometry, using high-frequency LiDAR scans for accurate mapping, particularly in scenarios where wheel encoders are unreliable.

The simulations are conducted in ROS Noetic on Ubuntu 20.04 using the TurtleBot3 model in the Gazebo simulation environment, with Rviz utilized for real-time visualization. Performance is evaluated based on mapping accuracy, computational efficiency, and robustness to sensor noise. Results indicate that GMapping excels in environments with reliable odometry, whereas Hector SLAM is better suited for systems lacking odometry, offering superior real-time performance.

This study provides insights into the advantages and limitations of both SLAM techniques, aiding in the selection of the most suitable approach based on specific robotic applications. Future research will explore hybrid SLAM methods that integrate both algorithms to enhance mapping accuracy and efficiency in diverse and dynamic environments

Keywords: *SLAM, GMAPPING, HECTOR SLAM, GAZEBO, RVIZ, LIDAR.*

ICRTTD-25/CH/14

SIMULATION OF ETHANOL WATER SYSTEM USING OPEN MEDIA SIMULATOR

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ABSTRACT

For the design, optimization, and control of various chemical operations and processes process simulation is the most useful tool. This tool is useful for development, design, and optimization of various types of chemical industrial process. In chemical and petrochemical industry, the most important unit operations which is used for separation, purification and reactions is the distillation. Out of different types of distillation process the batch process most widely used for recovery of most valuable and produce high purity products. With the help of open media simulator, we simulate the ethanol and water system by simulating Short Cut-Distillation column showing the results as optimal feed stage 9, actual feed stage 19, R. R. 3.9, and flow rate 100 kmoles/hrs. By using this value, we simulate the process in rigorous column for process optimization shows the condenser duty 2114 KW, Reboiler duty 2111 KW, no. of Stages 19, condenser pressure 1 Atm, and Feed stage 9. With the help of results obtained we can use the DWSIM open media simulator to simulate and optimize the process.

***Keywords**: Design, optimization, separation, batch distillation.*

REMOVAL OF HEAVY METALS FROM INDUSTRIAL WASTEWATER BY BIOSORPTION

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ABSTRACT

This paper has examined biosorption, an environmentally benign method for removing heavy metals from aqueous systems. One could think of biosorption as an alternative to the prevalent, unsustainable industrial processes now in use. Due to their high toxicity at extremely low concentrations, non-biodegradability in the environment and cumulative effects on living species, organic contaminants are among the most hazardous forms of contaminants found in water. Pollution of water supplies with these substances pollutes the whole food supply and causes serious damage to the environment. The elimination of ions of heavy metals from effluent is critical for maintaining a healthy environment and human wellness. Several strategies for removing heavy metal ions from different industrial effluents have been documented. These consist of oxidation, adsorption, precipitation, ion exchange, reverse osmosis, electrochemical processes, membrane filtering and evaporation. This paper evaluates and discusses each approach in detail, analyzing its advantages and disadvantages as well as the adsorbents utilized, the effectiveness of the removal process, operating circumstances, and other factors. The adsorption method is the most advantageous from an economic and separation standpoint among all of these. The types of biosorbents, biosorption mechanisms and variables influencing biosorption capacity are the main topics of this review.

Keywords: *Adsorbent, Biosorbents, Heavy metals, Mechanisms, Removal, Variables.*

ICRTTD-25/ME/16

SIMULATION OF LIDAR BASED AGV IN ROS

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ABSTRACT

Automated Guided Vehicles (AGVs) play a crucial role in industrial automation, where precise navigation and obstacle avoidance are essential for efficient operation. This research focuses on the simulation of a LIDAR-based AGV in the Robot Operating System (ROS), utilizing Gazebo and Rviz for environment visualization and real-time sensor data interpretation. The study integrates LIDAR sensors with SLAM (Simultaneous Localization and Mapping) algorithms to enable autonomous navigation and dynamic path planning. The AGV's movement is tested in simulated environments to evaluate mapping accuracy, obstacle detection, and localization efficiency. The results demonstrate that LIDAR-based AGV navigation in ROS achieves high precision and adaptability, making it a viable approach for real-world logistics, warehouse automation, and manufacturing applications

Keywords: *LIDAR, AGV, ROS, SLAM, Gazebo, Rviz, Autonomous Navigation, Simulation.*

ICRTTD-25/ME/17

PRODUCTIVITY IMPROVEMENT IN RETAIL PHARMA STORE BY USING QUALITY TOOLS

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ABSTRACT

The aim of this study is how to apply different quality tools in retail pharma store to improve productivity. This research study gives brief introduction about productivity improvement in retail pharma store. To achieve big customer satisfaction, in today's highly competitive retail pharma market there is a need of improvement in productivity. In This research study different quality tools used to reduce excess inventory cost, customer waiting time, reduce rejection of order from customer, drug finding problem, lot of expiry of medicine in retail pharma store. It also helps to set medicine in order, searching medicine within less time, easy to handle multiple customers, improve documentation, record keeping and cleanliness in retail pharma store. This all activity resulted in reduction of various cost in retail pharma process & helps to increase productivity of retail pharma store.

Keywords: *Quality Tool, Lean, six sigma, 5S, retail pharma store*

ICRTTD-25/CH/18

DEGRADATION OF PHENOL BY USING HYDROGEL NANOPARTICLES

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ABSTRACT

Phenol is a dangerous and cancer causing chemical that poses significant risks to both the environment and human health. Hydrogel nanoparticles, known for their extensive surface area, compatibility with biological systems, and adaptability, have emerged as a promising option for breaking down phenol. This review paper provides a comprehensive overview of the current knowledge on how hydrogel nanoparticles facilitate phenol degradation. We discuss the characteristics, manufacturing methods, and degradation mechanisms of hydrogel nanoparticles, highlighting their advantages and limitations. Additionally, we explore recent studies on how environmental factors, nanoparticle properties, and degradation conditions influence the effectiveness of hydrogel nanoparticles in degrading phenol. Finally, we identify the challenges and potential future directions for research in this area.

The review also explores the various mechanisms by which hydrogel nanoparticles interact with phenol molecules, including adsorption, catalysis, and photodegradation. Additionally, it discusses the role of different functional groups and surface modifications in enhancing the efficiency of phenol degradation. Finally, the paper highlights the importance of developing sustainable and cost-effective methods for large-scale production and application of hydrogel nanoparticles in environmental remediation.

Keywords: *Heavy metal, Environmental remediation, Phenol degradation, Hydrogel nanoparticles.*

A RESEARCH PAPER ON COLOR-BASED SORTING USING A 4-DOF ROBOTIC ARM

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ABSTRACT

This research focuses on the detailed design, development, and implementation of a color-based sorting robotic arm system. The system integrates a TCS3200 color sensor for color detection, an Arduino Uno for processing sensor data and controlling movements, and a 4-degree-of-freedom (DOF) 3D-printed robotic arm for physical operations. The primary objective of this system is to accurately detect and sort objects based on their colors—purple, blue, red, and green—into designated bins. To achieve this, the study covers the integration of hardware components, calibration of the sensor, programming of sorting logic, and testing under varied conditions. The focus is on optimizing the robotic arm's efficiency and reliability to ensure precise sorting in industrial applications. Results from extensive testing confirm the system's high accuracy and consistent performance, making it a viable solution for automating color-based sorting tasks in manufacturing and quality control environments.

Keywords: *Color-Based Sorting, TCS3200 Color Sensor, Arduino Uno, 4-DOF Robotic Arm, Industrial Automation, Object Categorization, RGB Detection, Conveyor Integration, AI-Based Calibration, Dynamic Lighting Conditions, Recycling, Quality Control, Food Processing, Automated Sorting Systems..*

ICRTTD-25/ME/20

OPTIMIZED MINIATURE MOVING COIL COMPRESSOR FOR STIRLING PULSE TUBE CRYOCOOLER: A CFD AND FINITE ELEMENT APPROACH

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ABSTRACT

Cryocooler technology offers a unique opportunity to overcome existing limitations by designing and modeling a miniature Stirling style cryocooler that utilizes pulse tube and a moving coil configuration. The primary objectives are to achieve a compact, light, and sturdy design, guaranteeing maintenance free functionality, especially in space-based applications. Finite element analysis (FEA) will be used to evaluate dynamic behavior, thermal performance, and structural integrity. Finite element analysis (FEA) is utilized to forecast the compressor's mechanical and thermal behavior under different operating scenarios, focusing on critical factors such as displacement, magnetic flux density, and stress distribution. An essential component of this design is the combination of a miniature compressor and motor, emphasizing efficiency and reliability. Addressing challenges associated with vibrations and maintenance is vital, as these problems frequently arise in conventional cryocoolers. The suggested design features a pulse tube and regenerator, which can enhance cooling efficiency by decreasing moving parts, thus reducing vibrations and maintenance requirements. This strategy can considerably enhance the reliability and operational lifespan of the cryocooler. Prior research indicated that frequencies exceeding 80 Hz could compromise efficiency. However, modeling has demonstrated that elevated frequencies (up to 150 Hz) can sustain efficiency by refining the regenerator design and amplifying average pressure. This paper outlines a design for a compact and reliable miniature Stirling style cryocooler that featuring pulse tube and a moving coil, aimed at enhancing cooling effect, minimizing maintenance challenges through innovative integration of components analyzed in Computational Fluid Dynamics (CFD) and structural finite element analysis for performance assessment.

Keywords: *Miniature, Pulse tube cryocooler, Moving coil, Stirling cryocooler, Design, compressor, CFD, FEA analysis*

ICRTTD-25/MK/21

VARIABLE SPEED COMPRESSOR CONTROL FOR IMPROVED ENERGY EFFICIENCY IN CONVENTIONAL REFRIGERATION SYSTEMS

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ABSTRACT

Refrigerator is an important domestic electrical device, but at the time of load shading or when the electricity is not available at that time, because of some drawbacks we can't operate this device on any inverter. The main reason why Refrigerator does not work on inverter is because of switching. Since the pressurized compressor of Refrigerator get continuously switched between ON and OFF, in order to maintain the temperature, it draws inrush current because of blocked rotor induction motor and as switching occurs frequently, compressor requires minimum three minutes to start again for proper working in Refrigerator. All these things have severe effect on the system such as Non-linear behavior of the device and also power quality gets deteriorated which needs to be controlled. The theme mainly works in this area and provides a solution to this problems. The paper includes an idea and provides a design of a driver circuit which operates the compressor of refrigerator with minimum frequency and voltage at minimum temperature. By using this driver the compressor of a refrigerator can be operate using solar panel (P-V Cell) operated inverter. The driver circuit eliminates the difficulty in operation of compressor while continuous ON-OFF switching of power supply across it. Instead of continuous ON-OFF switching, the driver circuit controls the temperature by gradually variation in the speed of compressor motor.

***Keywords**: Compressor, harmonics, inverter, refrigerator, switching etc.*

ICRTTD-25/ME/22

EFFECTIVE ENGLISH TEACHING METHODOLOGIES FOR ENGINEERING STUDENTS

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ABSTRACT

The present paper is an argument in favor of a consistent application of creative educational methods in the process of teaching English for Specific Purposes (ESP). The theoretical part explores the role and function of creativity in the context of the changing paradigm regarding the overall scope of the educational system in general and of the specialized language learning in particular, highlighting a series of factors pertaining to creative methodologies in ESP. This changing paradigm is triggered by the application of Industry 4.0 principles not only in the industrial sector, but also in the educational domains which form the professionals who will be acting in the industry 4.0 context. The study addresses problems faced by language instructors in achieving success in the acquisition of abroad language skills and competences by ESP students given the specifics of the language teaching process. It aims to demonstrate the benefit of applying creative and innovative methods in teaching ESP and to illustrate the conditions and factors which determine the best choice of methodologies, materials and activities involved in teaching English in technical academic environments. The research highlights the importance of the language instructor's choice of teaching strategies, materials and techniques in achieving overall language success. The application of creative methods in teaching ESP is one factors contributing to increased student motivation, which is one essential preconditions of the successful practice of language skills in a professional language context.

Keywords: *English for specific purposes; creative teaching; teaching methods; specialized language*

ICRTTD-25/AE/23

EXPERIMENTAL INVESTIGATION OF TRIBOLOGICAL BEHAVIOUR OF NANOCOATING FOR PISTON RING

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ABSTRACT

Nanocoating can help to improve performance and life of automotive engine by reducing the wear and friction between engine components. In this research Tribological properties of titanium dioxide (TiO_2) nanocoatings for piston ring application are investigated. Nanocoating Samples were prepared by sol-gel process of varying dipping and drying process cycles (40, 50, 60 and 70). The wear and friction experiment was carried on Pin on Disc Tribometer and the tests were performed with varying load and speed. The obtained results show that TiO_2 Nanocoating exhibits good friction reduction and anti-wear properties and also decreased the coefficient of friction by 4% and 8% at 60 and 70 dipping-drying process cycles respectively, as compared with conventional chromium platting. In addition, the topography of worn surfaces was analyzed by using Scanning Electron Microscopy (SEM).

Keywords- *TiO2 nanocoating, tribological properties, friction coefficient*

ICRTTD-25/AE/24

AI IN MODERN AUTOMOBILE

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ABSTRACT

Artificial Intelligence (AI) is transforming the modern automobile industry by enhancing vehicle performance, safety, and user experience. Autonomous driving is being advanced by AI-powered systems, which let cars to sense their environment, make decisions, and drive with little assistance from humans. Large volumes of data from sensors, cameras, and radar systems are processed by machine learning algorithms to enable advanced driver assistance systems (ADAS), which increase road safety by offering functions like adaptive cruise control, lane-keeping aid, and collision avoidance.

Moreover, AI enhances in-car connectivity and user interfaces, enabling voice recognition, personalized infotainment, and predictive maintenance. Smart algorithms optimize fuel efficiency and battery management in electric vehicles (EVs), contributing to sustainability efforts. The integration of AI in fleet management improves route optimization, reduces operational costs, and enhances logistics efficiency.

ICRTTD-25/AE/25

IMPLEMENTATION OF A LEAK TESTING MACHINE FOR RADIATORS AND EVAPORATORS

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ABSTRACT

Radiator is equipment which helps engine to cool down by heat transfer of engine heat to coolant& from coolant to the atmosphere. Radiators are used to cool large size engines. A water jacket is provided around which the coolant is provided so due to heat realized from the engine the coolant gets heated up & is cooled down by the radiator. The problems occurring during the assembly or during the manufacturing process. We created a pneumatic circuit for two leak testing machines as part of this project. Regardi**ng the pneumatic circuit design.** For the designing of the pneumatic circuit, we used the various components like pneumatic compressor unit, toggle operated 5/2 Direction Control Valve, hose, fittings and Double acting cylinder. We have completed the cylinder design for this project. The platform, which will support the stresses of the several radiators chosen for leak testing, moves up and down thanks to the piston. The pneumatic circuit is used to control the movement of the piston. The platform and tank designs have been completed. As the last step in this process, the design will be verified when the theory behind it has been finalized. The project's primary goal was to design and build a specialized leak testing apparatus.

Keywords: *Text detection, Inpainting, Morphological operations, Connected component labelling.*

ICRTTD-25/MK/26

A REVIEW PAPER ON AUTOMATIC SOLAR PANEL CLEANING SYSTEM

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ABSTRACT

This study focuses on the design and development of an automated system for cleaning dust from photovoltaic (PV) modules. Dust buildup is a common issue that reduces the efficiency of PV panels by blocking sunlight from reaching the module surface, leading to decreased energy output. The proposed system continuously measures voltage and current generated by the PV module to calculate the power output and detect efficiency drops caused by dust accumulation. A control circuit was designed and simulated using Proteus 8 Professional. Simulation results confirmed that the system could accurately identify power loss and trigger a motorized cleaning mechanism in response. Future work involves constructing a working prototype to assess the system's real-world performance.

Keywords: *Photovoltaic modules, dust removal, automated cleaning, power loss detection, solar panel maintenance.*

CONDITION MONITORING OF INDUCTION MOTOR USING FFT ANALYZER

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ABSTRACT

Sound and vibration are produced by any equipment that has moving elements. Every machine has a unique vibration signature that varies depending on its condition and design. The vibration signature will alter in tandem with any changes in the machine's condition. Before they become serious, early flaws can be found by observing a change in vibration signature 4. Many condition monitoring techniques start with this. By increasing maintenance efficiency and averting breakdowns, condition monitoring can lower the risk of serious accidents and save money. Vibration analysis has been widely developed over the course of around 35 years as one of the core methods for condition monitoring. These days, machine supervision is nearly entirely automated due to the concurrent advancements in electrical devices, transducers, computers, and software. The authors of the current article review various diagnostic methods for identifying bearing faults, with a focus on vibration analysis. Waveform analysis, time-frequency analysis, the Faster Fourier Transform (FFT), spectral analysis, order analysis, time synchronous average, and probability density moments are a few examples of commonly used bearing techniques. Due to their ease of measurement, these vibration-based diagnostic techniques have been the most widely used monitoring method. In the past, vibration analysis was primarily utilized to identify critical operating situations and problems. These days, the goal of condition monitoring and vibration analysis is not only to reduce the impact of machine failures but also to make better use of the resources that are already available.

Keywords: *Fast Fourier Transform (FFT),Vibration Analysis,Frequency Domain,Analysis Fault Diagnosis,Predictive Maintenance,Motor Fault Detection,Signal Processing,Mechanical Faults,Electrical Faults,Spectrum Analysis,Harmonic Analysis.*

ICRTTD-25/MK/28

AUTONOMOUS NAVIGATION SYSTEM FOR SPACE VEHICLE

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ABSTRACT

The investigation into extra-terrestrial environments necessitates the implementation of highly efficient and autonomous navigation systems capable of traversing uncharted and challenging terrains. This research centres on the development of an AI-driven Autonomous Navigation System for a Space Vehicle, designed to facilitate efficient movement, obstacle detection, and adaptive decision-making based on environmental conditions. The system integrates LiDAR, ultrasonic sensors, and advanced AI machine learning algorithms to ensure safe navigation and optimize path planning. This initiative aims to enhance the operational capabilities of space rovers in planetary exploration, sample collection, and environmental analysis. The proposed system holds the potential to significantly improve mission success rates, minimize operational delays, and reduce dependence on human oversight in deep-space exploration.

Keywords: *Autonomous Navigation, AI-based Rover, LiDAR, Planetary Exploration, Machine Learning, ROS-2 Humble*

ICRTTD-25/MK/29

AUTONOMOUS DRONE DELIVERY SYSTEM WITH ADVANCED NAVIGATION AND ULTRASONIC-BASED REAL-TIME OBSTACLE DETECTION AND AVOIDANCE

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ABSTRACT

The demand for efficient last-mile delivery solutions has led to advancements in autonomous drone-based logistics. This research presents the design and implementation of an autonomous drone delivery system that leverages Mission Planner software for flight path optimization, ultrasonic sensors for real-time obstacle detection, and a QR code-based authentication mechanism for secure package handling. The system autonomously computes and follows optimal routes using GPS-based navigation and sensor fusion techniques, ensuring precise and reliable deliveries with minimal human intervention. To enhance safety, real-time obstacle avoidance enables dynamic path adjustments, allowing the drone to navigate complex urban environments while preventing collisions. Secure package authentication is achieved through a QR code verification process, which, upon validation, triggers an electromagnet-based actuator to release the parcel. Performance evaluations demonstrate the system's ability to maintain accurate flight paths, avoid obstacles, and securely complete deliveries. By enhancing efficiency, safety, and cost-effectiveness, this system provides a scalable solution for e-commerce, healthcare, and emergency logistics, contributing to the evolution of autonomous UAV-based delivery technologies.

Keywords: *Autonomous Drone Delivery, UAVs, Mission Planner, Navigation Algorithms, Obstacle Detection, Electromagnet Actuator, Secure Authentication, Last-Mile Logistics.*

ICRTTD-25/MK/30

DEEP LEARNING BASED FAULT DETECTION IN AUTONOMOUS VEHICLE

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ABSTRACT

Autonomous vehicles rely on a complex integration of sensors, control systems, and artificial intelligence to ensure safe and efficient operation. However, system faults in perception, decision-making, and actuation components can compromise vehicle safety and performance. Deep learning-based fault detection has emerged as a robust solution to identify and mitigate these issues in real-time. This paper explores the application of deep learning models, such as Convolutional Neural Networks (CNNs), Recurrent Neural Networks (RNNs), and Transformer-based architectures, in detecting and classifying faults in autonomous vehicle subsystems. By leveraging sensor fusion techniques and advanced anomaly detection algorithms, the proposed approach enhances the reliability and robustness of fault diagnosis. Simulation results and real-world case studies demonstrate the effectiveness of deep learning in identifying faults in vision systems, LiDAR, radar, and vehicle dynamics. The findings highlight the potential of AI-driven fault detection to improve the safety and dependability of autonomous vehicles, paving the way for their widespread adoption.

Keywords: *Convolutional Neural Networks, Deep Learning, Recurrent Neural Networks.*

ICRTTD-25/MK/31

MICROCONTROLLER BASED BANK LOCKER SECURITY SYSTEM

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ABSTRACT

This research presents the design and implementation of a microcontroller-based bank locker security system that enhances protection through biometric and One-Time Password (OTP) authentication. The system utilizes a microcontroller (such as Arduino or PIC) to control a fingerprint scanner for biometric verification, ensuring that only authorized users can access the locker. Additionally, an OTP is generated and sent to the user's registered mobile number via a GSM module, adding a second layer of security. This dual-authentication approach prevents unauthorized access and provides a higher level of protection. The GSM module also allows real-time alerts to be sent to both the bank's security team and the locker owner in case of any suspicious activity or tampering. The system is designed to ensure continuous operation through a backup power supply, making it reliable even during power outages. This paper discusses the architecture, implementation, and advantages of combining fingerprint recognition with OTP-based security in banking environments. The proposed system is cost-effective, scalable, and offers a significant improvement in safeguarding customer valuables.

Keywords: *Microcontroller, Bank Locker, OTP, GSM Module*

ICRTTD-25/MK/32

ADVANCEMENTS IN ELECTRIC VEHICLES: THE FUTURE OF MOBILITY WITH SOLID-STATE BATTERIES

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ABSTRACT

Compared to traditional lithium-ion batteries, solid- state batteries (SSBs) promise improved energy density, safety, and longevity, thus ushering in a new paradigm for electric vehicles (EVs). This paper balances recent developments in SSB technology alongside possible performance, safety, and sustainability implications for EVs. It further addresses challenges that are presently working against widespread adoption, production complications, and material restrictions. By understanding recent research and industry trends, this paper emphasizes solid-state battery potential to change the electric vehicle landscape towards a more sustainable and efficient future in transportation.

Keyword: *Solid-state batteries, Electric vehicles, Energy density, Battery safety, Battery lifespan, Sustainable transportation, Battery technology, Electrolyte materials, Manufacturing challenges, Performance optimization.*

ICRTTD-25/MK/33

A RESEARCH PAPER ON IOT BASED SMART GREEN HOUSE SYSTEM

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ABSTRACT

The growing need for sustainable farming practices and optimized resource management has led to the adoption of the Internet of Things (IoT) technologies in greenhouse farming. An Internet of Things-based smart greenhouse system is presented in this research. designed to monitor, analyze, and regulate key environmental parametersvital for plant growth, such as light intensity, soil moisture, temperature, and humidity. By integrating multiple sensors and actuators, the system ensures ideal conditions for growth while minimizing resource wastage.

The setup is powered by an ESP32 microcontroller, which collects real-time sensor information and transmits it to a cloud-based platform for remote access. Users can monitor greenhouse conditions and actuators for control such as exhaust fans, ventilation systems, water pumps, as well as fogging mechanisms via a mobile or web application using the Blynk IoT platform. The system operates in both automatic and manual modes, allowing seamless control even when WiFi connectivity is unavailable. Additionally, an LCD display provides real-time updates on system status, including control mode and WiFi connection.

By implementing automated decision-making algorithms, the system enhances resource efficiency by reducing water consumption, optimizing energy use, and minimizing manual labor. A prototype implementation demonstrates significant improvements in crop yield and quality, validating The efficiency of the suggested approach. The study emphasizes the possibilities of IoT-based smart greenhouses in addressing challenges such as climate variability, labor shortages, and sustainable food production, making it a promising solution for modern precision agriculture.

ICRTTD-25/MK/34

AUTOMATIC NUMBER PLATE RECOGNITION WITH HIGH SPEED OF VEHICLE MAIL ALERT

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ABSTRACT

Automatic Number Plate Recognition (ANPR) is an essential technology for contemporary traffic oversight and law enforcement. This paper introduces an enhanced ANPR system aimed at detecting and recognizing vehicle license plates in high-speed environments while providing immediate alerts via email. The system is built on high-resolution cameras paired with machine learning-driven Optical Character Recognition (OCR) for precise plate identification. A strong image pre-processing workflow guarantees effective recognition, even under difficult circumstances like inconsistent lighting and motion blur. Information from the number plates is compared against a database, prompting immediate email notifications for vehicles that are blacklisted or unauthorized. The system is fine-tuned for swift processing, ensuring minimal delay and high accuracy. This development significantly improves traffic surveillance, toll automation, and security enforcement, becoming a crucial resource for smart cities and advanced transportation networks. Evaluations of the system's performance indicate high precision and low response times, making it ideal for real-world usages such as highway monitoring, toll collection systems, parking management, and security enforcement. The merging of artificial intelligence with classic ANPR greatly boosts both effectiveness and scalability, making this approach an important component in the evolution of intelligent transportation infrastructures. The ANPR system uses Optical Character Recognition (OCR) to accurately extract alphanumeric information from recorded plates, even in challenging situations such as low light, adverse weather, and rapid vehicle speeds.

Keywords: *Automatic Number Plate Recognition, High-Speed Vehicle Detection, OCR, Real-Time Alert System, Smart Traffic Management, Email Notification*

ICRTTD-25/MK/35

A REVIEW OF PAPER ON DESIGN OF AUTONOMOUS ROBOTIC BOAT FOR RESCUE APPLICATION

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ABSTRACT

The project titled "Design of Autonomous Robotic Boat for Rescue Application" aims to develop a reliable, efficient, and self-operating boat capable of conducting rescue operations in aquatic environments. This autonomous vessel is designed to navigate through water bodies, identify distressed individuals, and provide assistance without human intervention. Equipped with GPS, ultrasonic sensors, cameras, and communication modules, the boat can detect obstacles, locate victims, and communicate with a central control system. The primary focus is to enhance the boat's adaptability and responsiveness in diverse rescue scenarios, including floods, tsunamis, or other aquatic emergencies. By leveraging machine learning algorithms and advanced path-planning techniques, the boat autonomously calculates optimal routes to reach individuals in need. This project contributes to emergency response technology, offering a scalable and cost-effective solution to save lives in hazardous water environments. The proposed design can significantly improve the speed and safety of rescue operations, potentially reducing the risks faced by human rescuers in dangerous situations.

Keywords: *Flood, Security, Rescue, Remote Control, Maneuvering*

ICRTTD-25/CM/36

EXPLORING HYBRID APPROACHES: NLP AND MACHINE LEARNING MODELS FOR PREDICTING BOX OFFICE PERFORMANCE

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ABSTRACT

Accurate prediction of movie success is important for mitigating risk in the film industry. Many traditional models have had problems in predicting movie success due to dynamic factors such as audience sentiment and market variability that are missing in structured data and historical trends. This paper surveys recent work on hybrid models combining machine learning (ML) and Natural Language Processing (NLP) that make predictions more accurate. Combining structured and unstructured data, these models are capable of giving a more complete view of factors leading to the success of a movie, as is shown by different studies. These issues pertaining to data quality, model complexity, and computation burdens are articulated, together with possible remedies that could include adaptive preprocessing and XAI. Useful insight in making predictions models to better support this film industry improves its models in line with research directions into ways to optimize the marketing and distribution as well as the decision processes in general.

Keywords: *Movie Success Prediction, Hybrid Models, Machine Learning, Natural Language Processing*

ICRTTD-25/MK/37

SMART SHOPPING TROLLEY

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ABSTRACT

The Smart Shopping trolley design is a slice- edge outcome focused on transforming the conventional shopping experience by incorporating the latest technologies. focused on the ESP32 microcontroller, this revolutionary shopping wain features an advanced set of detectors, such as IR and ultrasonic detectors for mortal detection and shadowing, RFID technology for product recognition and automatic pricing, and cargo cells for accurate weight measurement. A DC motor paired with a motorist IC provides smooth wain movement, and a stoner-friendly display module offers real-time feedback on trolley status. The system not only demonstrates standalone wain navigation but also features automated pricing and load cautions, with the ability to examine and improve the performance and pleasure of ultramodern retail shopping

Keywords: *Shopping wain, ESP32, Sensor Integration, RFID Technology, Automated Pricing*

ICRTTD-25/MK/38

AUTOMATED SYSTEM FOR MONITORING SWIMMING POOL SAFETY BASED ON THE IOT

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ABSTRACT:

This project presents an automated, multi-sensor safety system for swimming pools aimed at preventing drowning incidents. It integrates laser scanners, depth sensors, and motion detectors to enable real-time monitoring of pool environments. The system identifies potential drowning by analyzing prolonged presence at critical depths, abnormal movement, or unauthorized access. A central processor fuses sensor data using advanced algorithms to distinguish between typical and emergency situations, triggering alarms and optional rescue actions. The system includes remote monitoring features, focusing on robust sensor integration and algorithm development for effective pool safety.

Keywords: *Swimming Pool Safety, IOT, Anti- Drowning, Lifeguard Alert, Sensors*

ICRTTD-25/MK/39

UNMANNED GROUND VEHICLE (UGV) FOR SURVEILLANCE & RECONNAISSANCE

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ABSTRACT:

The Unmanned Ground Vehicle (UGV) project aims to develop a cutting-edge platform for surveillance and reconnaissance, designed to operate autonomously or via remote control in diverse environments. Equipped with a suite of advanced sensors, including high-resolution cameras and thermal imaging, the UGV enhances situational awareness and data collection capabilities, making it invaluable for monitoring challenging areas. Its robust mobility allows navigation across various terrains, while autonomous navigation algorithms enable real-time mapping and decision-making. With secure communication channels to protect data integrity, the modular design supports easy upgrades based on mission requirements. This project promises to improve operational safety and efficiency in military, law enforcement, and disaster response contexts, paving the way for future advancements in unmanned systems technology.

Keywords: *Surveillance , Reconnaissance , Security , Military , Law Enforcement , Remote Control Vehicle.*

SELF-POWER GENERATION IN ELECTRIC VEHICLES USING DRIVING WHEEL

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ABSTRACT

The design and development of electric cars with DC motors that can charge themselves is aided by this research. Another name for these cars is self-power producing vehicles. It is composed of Two batteries, a charging unit and a DC motor with four gears. The vehicle's driving wheel was connected to the DC motor and took in torque from the wheel's displacement. The torque is transformed by the charging unit into electrical and electrochemical energy that is stored in the battery. The motor is set up to convert the battery's electrical energy into torque, which the driving wheel will use to move the car. The self-charging electric vehicle model's hardware prototype was created, and it showed off the drive system's functionality. The suggested model is easier to drive and more environmentally efficient. Lithium ion batteries, low cost systems, a variety of motor options and self-charging systems are the foundation of the future of electric vehicle technology.

Keywords: *Charging circuit, Batteries, DC motor, electric vehicle, voltage regulator and dynamo etc.*

ICRTTD-25/MK/41

IOT BASED BIKE RIDER SAFETY MONITORING SYSTEM

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ABSTRACT:

Road safety for two-wheeler riders is a significant concern due to helmet non-compliance, drunk driving, signal violations, and delayed emergency response. This project presents an IoT-based bike rider safety and traffic monitoring system that improves safety through real-time monitoring, automated alerts, and cloud-based data storage. The system consists of three primary units: Helmet Unit, Bike Unit, and Signal Unit, each designed to enhance road safety. The Helmet Unit ensures that the rider wears a helmet and is not intoxicated using IR and MQ-3 sensors. If the rider fails to meet these conditions, the bike remains locked, and the event is recorded in the IoT cloud. The Bike Unit monitors side stand position, oil level, and obstacle detection using a limit switch, ultrasonic sensors, and an LCD display. It also integrates a MEMS sensor that detects if the bike tilts 90 degrees, indicating a possible accident. Upon detection, the GSM module sends an emergency SMS alert with GPS coordinates to predefined contacts.

The Signal Unit enforces traffic signal compliance using an RFID scanner and ultrasonic sensors, ensuring no vehicle crosses during a red light. All real-time data from the Helmet Unit and Bike Unit is uploaded to the IoT cloud, allowing remote monitoring and quick emergency response. By combining IoT connectivity, sensor-based automation, and cloud-based monitoring, this system provides an efficient and scalable solution for accident prevention, traffic regulation, and improved rider safety.

Keywords: *IoT-based bike safety, Smart helmet system, Real-time accident detection, Traffic rule enforcement, Emergency alert system.*

ICRTTD-25/ME/42

ANALYZING THE MECHANICAL CHARACTERISTICS OF TIG-WELDED ALUMINUM ALLOY EFFECTED BY WELDING CURRENT

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ABSTRACT

Weld current as a variable parameter for the structural and mechanical properties of AA-5083 alloy to find out ideal welding current.AA-5083 alloy plates were linked using the TIG welding process. Vickers' micro-hardness, tensile, and optical microscopy tests were used to examine the welded specimens. The welded zone, HAZ, and base metal transition sites were characterized. using optical microscopy Better mechanical qualities and microstructures were discovered in the welded joints with the 75A weld current. AA-5083 is utilized in marine applications and has exceptional resistance to general corrosion. Excellent resistance is found in aqueous solutions with a pH between 4 and 9. Aluminum alloys' ability to withstand corrosion depends on a protective oxide layer that, when broken, can be easily restored by the quick interaction of aluminum with oxygen. It is frequently utilized in the production of unfired, welded pressure tanks, drilling rigs, TV towers, marine, auto aircraft cryogenics, and transportation equipment such railroad trains, tip truck bodies, and vehicle bodies. By using TIG welding technique yielding improved structural and mechanical qualities.

Keywords: *TIG Welding, Welding current, Hardness, Aluminium Alloy-5083, Tensile Strength.*

ICRTTD-25/CH/43

REMOVAL OF HEAVY METALS FROM THE GALVANIC INDUSTRY

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ABSTRACT

Due to the ongoing release of unknown chemicals into the environment, tenacious substances are an increasing concern in water contamination. Currently, one of the main objectives is to select acceptable procedures and create suitable approaches for removing harmful wastewater impurities from industrial operations. Highly toxic cyanide, heavy metal ions, oils and greases, organic solvents, and the various facets of effluents are all present in the wastewater produced by the galvanic industry. Additionally, it may also contain BOD, COD, SS, DS, TS, and turbidity. The wastewater from the electroplating sector contains these metal ions, which is why the water is so caustic and harmful. These heavy metals must be eliminated since they are poisonous to all living things and should not be ingested by humans, animals, or plants. An extended exposure to galvanic wastewater can result in lung cancer, digestive system cancer, anemia, hepatitis, and maxillary sinus cancer in humans in addition to necrosis and nephritis. Effluents from the galvanic process must be treated properly before being released into the environment. In this article, novel methods for treating wastewater from the galvanic industry are examined and evaluated. These methods include coagulation and flocculation, chemical precipitation, ion exchange, membrane filtration, adsorption, and advanced oxidation process (AOP). These physicochemical methods, however, have a number of disadvantages, such as a high initial investment and operational cost because they require expensive chemical reagents, the formation of metal complex sludge that requires further treatment, and a protracted recovery process. In addition, cutting-edge methods like electrochemical treatment may get rid of a variety of organic and inorganic impurities like BOD, COD, and heavy metals. The removal of heavy metals from galvanic effluent is primarily the focus of this research. Based on the volume and properties of the produced effluent, this paper will be useful in choosing effective treatment methods.

Keywords: *Galvanic wastewater; physical treatment, chemical treatment, bioremediation, hybrid treatment*

EXPERIMENTAL ANALYSIS AND OPTIMIZATION OF PROCESS PARAMETERS OF WEDM FOR D2 STEEL

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ABSTRACT

Wire Electrical Discharge Machine(WEDM) are crucial for cutting conductive metals of any hardness and materials that are difficult or impossible to cut with traditional methods. These machines excel in creating complex contours and delicate geometries that conventional cutting methods struggle to produce. Despite significant advancements in the machine tool industry over the past decade, machine tools are often underutilized due to suboptimal operating conditions. This limitation has long attracted the attention of researchers and engineers who seek to identify the optimal operating parameters. The primary objective of this research is to investigate the effects of various WEDM process parameters on machining quality and determine the optimal parameter sets to improve the quality of machined parts. Initially, the working parameters ranges and its levels of WEDM parameters will be identified using a one-factor at- a-time approach. A half-fractional second-order central composite rotatable design will plan experiments, varying input parameters like pulse on time, pulse off time, spark gap voltage, peak current, wire tension to ascertain their effects on responses. Response Surface Methodology (RSM) will be employed to analyse these effects and predict optimal parameter sets for superior quality characteristics. This research works to examine the effects of WEDM parameters such as cutting rate, surface roughness, gap current & dimensional deviation during machining. Further metallurgical investigation will be carried out on samples cut by optimum process parameters. Mathematical models and response surfaces for these quality characteristics will be developed. This comprehensive approach aims to optimize WEDM Process parameters for improved machining quality.

Keyword: *Wire EDM Process parameters, central composite design, Response Surface methodology, Surface Roughness*.

ICRTTD-25/MK/45

THE FUTURE OF HYDROGEN FUEL TECHNOLOGY IN E-MOBILITY: CHALLENGES AND OPPORTUNITIES

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ABSTRACT

Hydrogen fuel development presents a promising elective to ordinary fossil fills in e-mobility. With its potential for zero-emission transportation and tall essentialness thickness, hydrogen offers a conservative and viable course of action to address climate modify and decrease reliance on fossil fills. Be that because it may, the wide determination of hydrogen fuel innovation faces a number of challenges, tallying establishment change, hydrogen era costs, and security concerns.

This paper examines conclusion of the of hydrogen fuel advancement in e-mobility, analyzing its potential benefits, challenges, and openings. It burrows into the specialized points of hydrogen fuel cells, hydrogen era techniques, and capacity courses of action. Too, the paper talks approximately the current state of hydrogen establishment advancement, government courses of action and persuading strengths, and the budgetary common sense of hydrogen-powered vehicles.

This paper focuses to supply bits of information for policymakers, examiners, and industry accomplices by analyzing the challenges and openings related with hydrogen fuel advancement. It concludes with recommendations for enlivening the determination of hydrogen fuel development and ensuring its productive integration into the transportation fragment.

Keywords: *Hydrogen fuel technology, E-mobility, Zero-emission transportation, Climate change, Fossil fuels, Hydrogen fuel cells*

A SURVEY ON HEALTH CARE USING AI

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ABSTRACT

This survey delves into the transformative role of Artificial Intelligence (AI) in healthcare, examining its multifaceted impacts on patient care, operational efficiency, and medical research. Through a comprehensive analysis of existing literature and empirical data, the abstract elucidates AI's potential to revolutionize diagnostics, treatment planning, and disease management. Additionally, it explores the ethical and regulatory challenges surrounding AI integration in healthcare systems, highlighting the imperative for responsible implementation to ensure equitable access and patient privacy. Overall, this survey offers valuable insights into the evolving landscape of AI-driven healthcare and underscores the necessity for ongoing research and collaboration to maximize its benefits while mitigating potential risks.

Keywords- *Artificial Intelligence, Healthcare, Diagnostics, Ethics, Implementation.*

ICRTTD-25/MK/47

ANIMAL HEALTH MONITORING SYSTEM USING IOT TECHNOLOGY

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ABSTRACT

Animal health monitoring is crucial for ensuring livestock productivity and welfare, particularly in large-scale farming systems. Traditional methods for health assessment are often labor-intensive and prone to human error. Recent advancements in artificial intelligence (AI) and machine learning (ML) have paved the way for automated and accurate health monitoring solutions. This report presents an Animal health monitoring system that leverages image processing and sensor data analysis to detect early signs of diseases and anomalies in animal behavior.

The system utilizes convolutional neural networks (CNNs) and deep learning algorithms to process data collected from wireless sensor networks (WSNs) feed in real time. A comprehensive evaluation was conducted to assess system accuracy, robustness, and scalability, demonstrating promising results in detecting common diseases and abnormal behaviors. However, challenges remain in generalizing the model across different species and optimizing its cost-effectiveness for small-scale farmers. Addressing these challenges will pave the way for efficient, real-time health monitoring solutions in modern livestock management.

Keywords: *Animal Health Monitoring, Artificial Intelligence (AI), Machine Learning (ML), Convolutional Neural Networks (CNNs), Deep Learning, Wireless Sensor Networks (WSNs), Real-Time Monitoring, Livestock Management, Disease Detection, Image Processing*

ICRTTD-25/ME/48

THE ROLE OF HUMAN RESOURCES AND GREEN INNOVATIVE TECHNOLOGY RENEWABLE ENERGY CONSUMPTION

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ABSTRACT

The Mercosur countries which include Argentina, Brazil, Paraguay, Uruguay, and Venezuela have all shown rising interest on renewable energy as the follow. This change is occasioned by the desire to overcome the reliance of energy on fossil-based products and combat the impacts of climate change. The global demands for sustainable development for the countries of the world press on the Mercosur countries to implement policies and strategies that support styles and initiatives to increase the consumption of renewable energy in an effort to enhance green innovation. This study examines renewable energy consumption in Mercosur Region and the role of human resources and green innovative technology. For this purpose, used Panel data of Mercosur countries and applied CS-ARDL model. The study show comparing Short-Term and Long-Term Short-term marginal or negative impacts give way to long-term positive and substantial benefits for a number of variables (such as GDP, government effectiveness, and green innovation). This implies that certain variables, such economic develop- ment and green innovation, have a delayed reaction to successfully influencing the dependent variable. Ur- banization has a crucial role in promoting outcomes like the use of renewable energy, as shown by its continuously high positive short- and long-term benefits. Given their long-term advantages despite their less pronounced short-term effects, policymakers need to concentrate on promoting green innovation and economic development. Over time, significant gains may be made by enhancing government efficacy and human capital. A strong adjustment mechanism is shown by the substantial error correction term, which guarantees that short- term deviations will eventually converge to a stable long-term connection.

Keywords: *Renewable Energy Consumption Mercosur Region,Human Resources,Green Innovative Technology*

ICRTTD-25/CE/49

EXPERIMENTAL STUDIES ON EFFECT OF COLLOIDAL NANO SILICA ON DURABILITY OF MARINE AND OFFSHORE STRUCTURE SUBJECTED TO CHEMICAL ATTACK

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ABSTRACT

Nanotechnology is one of the most active research areas that relates with number of disciplines including Civil engineering and it may have great impact on the field of construction materials. The literature survey shows that little is reported to evaluate the durability aspect of HSC(High strength concrete) incorporating Colloidal nano silica (CNS). This paper deals with studying the effect of CNS on durability properties of HSC subjected to acid attack (H2So4,and HCL) by conducting the tests such as Compressive strength, Weight loss, SCM ,ESD and linear regression analysis etc. The experimental study is carried out on M 60 grade of concrete with varying percentage of P-63 grade of fly ash from 5% to 25 % and P-100 grade of fly ash with constant 10 % replacement by weight of cement (b.w.c) also percentage of CNS varies from 1% to 5% b.w.c The result shows that 20% replacement of cement by fly ash and 3% addition of CNS gives satisfactory results when compared with other mix proportions.

Key Words- HSC, CNS, Acid attack, weight loss, strength

SMART VEHICLE OVERLOAD ALERT AND CHALLAN SYSTEM

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ABSTRACT

The issue of vehicle overloading has become a major concern worldwide, affecting both road safety and infrastructure durability. Overloaded vehicles are more likely to cause accidents due to reduced stability, increased braking distance, and higher chances of tire blowouts. Additionally, excessive weight puts undue stress on roads and bridges, leading to faster deterioration and costly repairs. Traditional methods of controlling vehicle overloading, such as manual checking at weighbridges, are inefficient, time-consuming, and susceptible to human errors and corruption.

To address these challenges, this paper presents an intelligent Smart Vehicle Chalan Overload and Alert System that uses load sensors, RFID technology, and GSM modules to automate the real-time monitoring of vehicle weight and enforce regulations by issuing automated challans (fines) for overloading violations. This system offers an accurate, efficient, and corruption-free method of traffic regulation that reduces road damage and enhances vehicle safety.

Keywords: *Vehicle Overloading, Load Sensors, Automated Challan, RFID, GSM, Traffic Management, Road Safety*

ICRTTD-25/CH/51

APPLICATION OF MEMBRANE SEPARATION TECHNOLOGY IN WASTEWATER TREATMENT IN THE FOOD INDUSTRY

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ABSTRACT

Food industry generates large volumes of wastewater, which contain high organic loads, oils, fats, suspended solids, and other pollutants. Traditional methods of wastewater treatment, such as chemical coagulation, flocculation, and biological processes, have limitations in terms of efficiency and environmental sustainability. In wastewater treatment, membranes are used to separate contaminants from water by applying a pressure-driven force or electrochemical gradient, allowing specific components of the mixture to pass through the membrane while retaining unwanted substances such as suspended solids, microorganisms, and dissolved contaminants. Membrane separation technologies, including microfiltration (MF), ultrafiltration (UF), nanofiltration (NF), and reverse osmosis (RO), have attracted significant attention as advanced solutions for treating wastewater in the food industry due to their high efficiency, scalability, and ability to produce high-quality wastewater. This paper reviews the principles of membrane separation technologies, their applications in the food industry, the challenges in their implementation, and the future trends in treating wastewater in the food industry.

Keywords: *Wastewater treatment, food industry, membrane separation, pressure-driven force, microfiltration, ultrafiltration, nanofiltration, reverse osmosis, Environmental sustainability*.

ICRTTD-25/CH/52

A RENEWABLE SUBSTITUTE FOR FOSSIL FUELS: MICROALGAE AS A SUSTAINABLE FEEDSTOCK FOR THE PRODUCTION OF BIODIESEL

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ABSTRACT

Due to the steady depletion of fossil fuel supplies, the continued use of fossil fuels has resulted in problems including air pollution and global warming. Thus, there is an urgent need for renewable energy sources that might lessen the environmental problems brought on by the usage of fossil fuels. Fossil fuel prices are increasing in tandem with energy demand, and this is closely related to the inflation of other commodities in emerging countries. Therefore, in an attempt to lessen the gap between the availability and demand of fossil fuels, more and more research is being done on alternative renewable fuels like bioethanol, biodiesel, and others. Because the first and second generations of biofuel can lead to food issues, researchers are looking into third-generation feedstocks for energy generation. Because of its high oil content and quick biomass production, microalgae could be used in place of biodiesel.

Keyword: *Microalgae, Renewable Energy, Biodiesel, Fossil fuel.*

ICRTTD-25/ME/53

COTTONSEED OIL AS AN ECO-FRIENDLY ALTERNATIVE IN INDUSTRIAL APPLICATIONS

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ABSTRACT

The demand for sustainable and environmentally friendly alternatives in various industrial sectors has led to increased interest in plant-based oils. Cottonseed oil, derived from the seeds of cotton plants, presents a promising candidate due to its abundant availability, biodegradability, and favorable physicochemical properties. This paper explores the potential applications of cottonseed oil in industrial processes, analyzing its advantages, limitations, and future prospects. By evaluating its chemical composition, performance metrics, and comparative benefits over conventional petroleum-based lubricants and fuels, this study highlights the viability of cottonseed oil as a sustainable resource. Additionally, this research examines ongoing advancements and technological innovations that could enhance the use of cottonseed oil across multiple industries, contributing to a greener and more efficient future.

Keywords: *Biodegradability, Environmentally friendly, Physicochemical*

ICRTTD-25/MK/54

AUTOMATED PESTICIDE SPRINKLER SYSTEM USING RASPBERRY PI AND HMI FOR SMART FARMING

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ABSTRACT

The "Automated Pesticide Sprinkler System Using Raspberry Pi and HMI for Smart Farming" project aims to enhance pesticide application in agriculture through automation and precision technology. Utilizing a Raspberry Pi microcontroller as the central processing unit, the system collects real-time data from environmental sensors to monitor soil moisture, temperature, and pest presence. This data-driven approach ensures pesticides are applied precisely and only when necessary, reducing wastage and minimizing human exposure to harmful chemicals. The integration of a Human-Machine Interface (HMI) provides farmers with an intuitive platform to monitor system performance, receive alerts, and manually control the sprinklers. This project advances smart farming practices by improving the efficiency, safety, and sustainability of pesticide application, contributing to higher crop yields and better resource management.

Keywords: *Smart Farming, Precision Agriculture, Raspberry Pi, Human-Machine Interface (HMI), Automated Pesticide Sprinkler System*

RENEWABLE ENERGY FROM AGRICULTURAL WASTE

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ABSTRACT

The global transition towards sustainable energy solutions has increased the urgency of exploring alternative and renewable fuel sources. India, as one of the largest consumers of energy, has implemented various policies to reduce its reliance on fossil fuels by promoting bioethanol production. Traditionally, ethanol in India is derived from molasses, a by-product of the sugar industry. However, this dependency poses several challenges, including seasonal fluctuations in sugarcane production, competition with other industries, and environmental concerns related to wastewater generation. To address these issues, agricultural waste such as wheat straw, rice husk, sugarcane bagasse, and corn Stover has emerged as a viable alternative for bioethanol production. These lignocellulosic residues are abundant, cost-effective, and offer an eco-friendly solution to both energy production and agricultural waste management.

This study provides a comprehensive analysis of the potential of agricultural waste as a renewable energy source, highlighting its conversion processes, technological advancements, and economic feasibility. The bioethanol production process from agricultural waste involves pre-treatment, enzymatic hydrolysis, fermentation, and distillation, all of which require optimization for large-scale commercial viability. Despite the promising prospects, challenges such as high processing costs, infrastructure limitations, and technological barriers hinder widespread adoption. The paper also examines India's government policies, including the National Bio-Energy Mission and ethanol blending programs, which aim to support the biofuel industry.

The findings suggest that utilizing agricultural waste for bioethanol production can significantly contribute to reducing fossil fuel dependency, mitigating pollution from crop residue burning, and enhancing rural economic development. By integrating innovative biorefinery models and improving enzymatic efficiency, India can achieve its ethanol blending targets while ensuring sustainable energy security. The study concludes that continuous research, supportive policies, and infrastructure investments are critical to making agricultural waste-based bioethanol a mainstream renewable energy source.

Keywords: *Renewable energy, agricultural waste, bioethanol production, biomass conversion, lignocellulosic ethanol, sustainable fuel, biofuels, bio economy, waste-to-energy, ethanol blending, energy security, environmental sustainability.*

ICRTTD-25/ME/56

EFFECT OF LOAD AND TEMPERATURE ON HYBRID METAL MATRIX COMPOSITE FOR LINEAR RECIPROCATING TRIBOMETER –A REVIEW

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ABSTRACT

Aluminium alloy based composites used in several applications due to its versatile properties. Several applications involving dynamic contact stresses require excellent wear and frictional performance for improved life. composites are found to perform exceedingly and alloys in several lab scale tribological investigations carried out so far in the last decade. In this article, an attempt is made to review those published reports about dry sliding tribological behavior of particulate-reinforced Aluminium composites. Different characteristics like load, speed, contact conditions, and the system-generated in situ tribolayer are all interrelated, and intrinsic elements like reinforcement, manufacturing method, and microstructure are discovered to have an impact on wear and friction, which are system properties.

Keywords-*Aluminum matrix composites, Liner Reciprocating Tribometer, Wear, friction, Taguchi analysis*

ICRTTD-25/MK/57

A REVIEW PAPER ON FACIAL EMOTIONS RECOGNITION SYSTEM USING DEEP LEARNING

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ABSTRACT

The recognition of facial emotions plays a critical role in human-computer interaction, enabling machines to better understand and respond to human emotions. This project presents a “Facial Emotion Recognition System” leveraging deep learning techniques to accurately classify emotions from facial expressions. The system utilizes convolutional neural networks (CNNs) for feature extraction and classification, trained on a large dataset of facial images with labeled emotional states. Key facial emotions such as happiness, sadness, anger, surprise, disgust, and fear are identified by analyzing subtle facial features like the shape of the eyes, mouth, and eyebrows. The proposed model is evaluated for performance using metrics such as accuracy, precision, and recall, with results indicating high classification performance across multiple emotions. The effectiveness of data augmentation techniques and pre-trained models (such as VGG16) in improving system robustness is also explored. This system has the potential for applications in fields such as mental health monitoring, human-robot interaction, and adaptive user interfaces, contributing to a more intuitive and responsive interaction between humans and machines.

Keywords: *Facial Emotion Recognition, Deep Learning, CNNs, Feature Extraction, Classification, VGG16, Performance Metrics, Human-Computer Interaction.*

ICRTTD-25/CH/58

SYNTHESIS, CHARACTERIZATION, AND PERFORMANCE INVESTIGATION OF TIO_2 FUNCTIONALIZED CA FORWARD OSMOSIS MEMBRANE FOR TANNERY WASTEWATER TREATMENT

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ABSTRACT

Presently, various wastewater treatment methods are available for the effective treatment and removal of pollutants from wastewater. However, due to energy requirements and maintenance these conventional techniques have many limitations at the pilot scale. To mitigate the limitations of conventional wastewater treatment methods, forward osmosis treatment technology is an innovative treatment for industrial wastewater treatment. In the present study, the cellulose acetate membrane is functionalized using TiO_2 nanoparticles with enhanced membrane characteristics. The properties of pure and functionalized CA membranes are investigated using FTIR, SEM-EDX, water contact angle, AFM, and tensile strength studies. Based on the analytical analysis, the TiO_2/CA FO membrane exhibits uniform pore size, hydrophilicity, good mechanical strength, and superior surface roughness characteristics. This study uses a NaCl solute as a draw solution to examine the effectiveness of the CA and TiO_2/CA FO processes for concentrating tannery industry wastewater. Using a higher concentration of NaCl solution in the FO system, superior flux is obtained using TiO_2 functionalized CA membrane. It is observed that; the prepared membrane can be used for different industries wastewaters treatment using FO system.

Keywords: *Tannery Industry Wastewater, Forward Osmosis, Cellulose Acetate Membrane, TiO_2 Nanoparticles, Draw Solution.*

LOKNETE. DR. BALASAHEB VIKHE PATIL
(PADMA BHUSHAN AWARDEE)
PRAVARA
RURAL EDUCATION SOCIETY

THE PRAVARA STORY . . .

Pravara Rural Education Society (PRES) was set up to utilize education for nation building, integrated rural development and women empowerment. Creating versatile and socially responsible professional leaders for holistic and sustainable development is the cornerstone of our belief system. PRES' commitment to excellence has won numerous awards and accolades even as alumni adds feathers to our proud cap.

Debt, starvation and inflation had ravaged farmers around Loni in the slowdown following the Second World War. The tough times got a tough man going. Convinced of the power of unity, Padmashri Dr. Vitthalrao Vikhe Patil braved innumerable obstacles to establish Asia's first cooperative sugar factory in 1950. Even the poor donated. Soon, the plant created prosperity for hitherto debt-ridden farmers !

A shrewd visionary, he realized financial upliftment was not enough. Having faced acute shortage of well-educated manpower when setting up the factory, he knew only quality education would truly and completely set people free. Once again, he took the plunge, convincing people on the merits of education by visiting their homes personally. And once again, people placed their faith and funds in him !

From humble beginnings - the Pravara Public School started with 27 students and a handful of teachers in 1964 - PRES has expanded into 102 institutes spread across Loni, Sinnar, and Ahmednagar. A 2,500+ strong faculty nurtures over 42,000 students, the next generation of the country from KG to PG to Ph.D.

Our story takes another pioneering turn in 1981. Industry had run into skilled manpower scarcity while unemployment confronted rural youth who were put off by the long waiting period till graduation after 10th standard. But government diploma colleges only offered limited seats. It was then that late Padmabhushan Balasaheb Vikhe Patil established Maharashtra's first private diploma engineering college. The rest is history !

ABOUT INSTITUTE

Padmashri Dr. Vitthalrao Vikhe Patil Institute of Technology and Engineering (Polytechnic), Pravaranagar (Loni) was established in August 1981. It is one of the first of its kind established on No Grant Basis in the State of Maharashtra. The necessity to establish a technical institution in the rural area was felt long back by the great visionary Late Padma Bhushan Dr. Balasaheb Vikhe Patil. He was of the firm opinion that it is essential to provide higher educational facilities to the rural youths because they are not in a position to compete with their urban counterparts in the race to secure admission in technical institutions due to lack of proper facilities and guidelines.

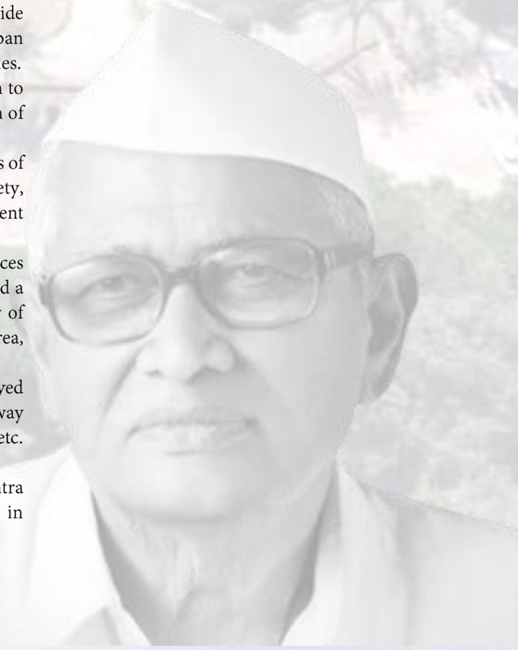
Ever since, the Pravara Rural Education Society established in the year 1964, striving to bring the education to the door steps of the rural masses. The Pravara Rural Education Society lays special emphasis on the education of women as well.

Late Padmashri had realized that unless the women folk of the rural area are properly educated, real progress of the rural area is not possible. Under the dynamic leadership of the Chairman of Pravara Rural Education Society, Hon'ble Shri. Radhakrishna Vikhe Patil, , the Pravara Rural Education Society has become one of the prominent institutions in rural area providing educational facilities in almost all faculty.

The education in general and technical education in particular is a vital component of Human Resources Development which has dynamism to change the quality of life in rural area. The institute has therefore played a very significant role in imparting technical education at middle level, particularly to the rural youths. Many of these young engineers have become entrepreneurs and have created employment opportunities in the rural area, thereby restricting the flow of rural youths to urban areas to some extent.

This polytechnic is consistently training the youth to make them employable or to become self-employed person. In addition to running formal diploma courses, we take care of overall development of the students by way of training them on soft-skill, industrial training , industrial visits, expert lecturers & value addition courses etc. Our institute is taking an active part in the overall development of the rural region in its humble way.

Pravara Rural Education Society has been awarded as the Best Educational Institution by Govt. of Maharashtra in 2003 and certified by ISO 9001-2000 organization in 2007, and "Dr.A.P.J.Abdul Kalam innovation in governance" award-2016, (Excellent Education Institute) by Indo-US foundation, New Delhi, in 2016.



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