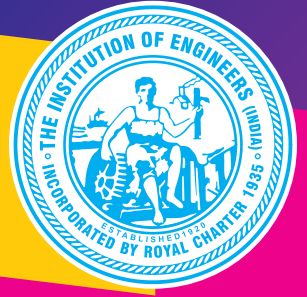


IEI EPITOME



Volume 9 | Issue 4 | April 2024

A Century of Service to the Nation

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Notification for IEl R&D Grant-in-Aid

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To promote appropriate technology, assist in building up design & research talents and, most importantly, to help in nurturing potential R&D venture amongst engineering students pursuing Diploma/UG/PG/PhD courses. The Institution of Engineers (India) had instituted the R&D Grant-in-Aid program way back in 2001.

Every year, the Institution invites applications for funding industry-oriented R&D projects and research initiatives aimed at improving the life-style of common people from engineering students pursuing full time Diploma/UG/PG/PhD engineering program in AICTE/UGC/NAAC approved Institutions / Colleges / Universities. The application form and guidelines are available in our website <https://www.ieindia.org>. The projects should be carried out under the guidance of faculty members who are Corporate Members of IEl. Membership criteria for student(s), guide(s) and institution(s) are as follows:

Project Category	Student/Applicant Membership	Guide(s) Membership	Institutional Membership
1. Diploma	Exempted [Membership of Student Chapter is desirable]	AMIE/MIE/FIE	Not Mandatory
2. UG (BE/BTech/ Equivalent)	'Student Member' (SMIE)	AMIE/MIE/FIE	Applicant's Institute should preferably be an Institutional Member with NBA/NAAC Accreditation or valid NIRF Rank
3. PG (ME/MTech/ Equivalent)	AMIE/MIE/FIE	MIE/FIE	Applicant's Institute should preferably be an Institutional Member with NBA/NAAC Accreditation or valid NIRF Rank
4. PhD	AMIE/MIE/FIE	MIE/FIE	Applicant's Institute should preferably be an Institutional Member with NBA/NAAC Accreditation or valid NIRF Rank

The soft copy of the duly filled-up applications (in editable format), as per the proforma available on our website www.ieindia.org, should be sent through email to research@ieindia.org and one printed copy of the same should reach the following address:

The Deputy Director (Technical)

The Institution of Engineers (India)
8 Gokhale Road, Kolkata 700 020

Kindly go through the guidelines (visit link: <https://www.ieindia.org/webui/IEI-Activities.aspx#RnD-Initiative>) before filling up the application.

Members in the News

Volume 9 | Issue 4 | April 2024



Dr Rahul Nagnath Yerrawar, AMIE

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Dr Rahul Nagnath Yerrawar is the one of the Patentee for an invention entitled “**Magneto-Rheological Strut for Light Commercial Vehicle**”.

Patent Number : 505730
Application Number : 201821006522
Date of Filing : 21/02/2018
Date of Grant : 31/01/2024
Post Grant Journal Date : 02/02/2024
Other Applicant Name : Rachayya Rudramuni Arakerimath
Field of Invention : Mechanical Engineering
Issuing Authority : The Patent Office, Government of India



Er N Prakash, MIE

Director

Vahyu Techno Engineers Pvt.Ltd., Chennai, Tamil Nadu

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Er N Prakash has been selected as **Vice-Chair**, Tamilnadu section of **The American Society of Mechanical Engineers (ASME)** for the term 2024-25 and the launch of the New Section Leadership Team held on 23rd January 2024.



Er Anand K Joshi, MIE

Research Scholar

Presidency University, Bangalore, Karnataka

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Er Anand K Joshi received prestigious **Padma Vibhushan Prof U R Rao Award 2023-24 (Post Graduate Level)** from **Karnataka Science and Technology Academy (KSTA)**, Government of Karnataka for innovative research project entitled “**Innovative Heat Dissipation Technique in Lithium Ion Battery Using Nano enhanced PCM**” on the occasion of **National Science Day** on 28 February 2024.

Publication by Members

Volume 9 | Issue 4 | April 2024

Book



Er Sashi Kanth Betha, MIE

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MACHINE LEARNING

About the Book

Welcome to the exciting and rapidly evolving world of Machine Learning! This book is your gateway to understanding and harnessing the power of intelligent algorithms that can learn from data and make predictions, decisions, and recommendations. Machine Learning is transforming our lives and industries, and it's likely you've encountered its applications, from personalized content recommendations to self-driving cars and medical diagnosis.

Machine Learning is not just a buzzword; it's a paradigm shift in how we approach problem-solving and decision-making. This book is designed to be your companion on a journey through the foundations, techniques, and practical applications of this dynamic field. Whether you are a student taking your first steps into the world of machine learning, an experienced practitioner seeking to deepen your understanding, or someone simply curious about the algorithms that power the digital age, this book is for you.

We begin with the basics, providing a clear and intuitive introduction to the core concepts and techniques of Machine Learning. From supervised and unsupervised learning to deep learning and reinforcement learning, you'll find comprehensive coverage of the most important paradigms and algorithms.

Machine Learning is as much an art as it is a science, and our goal is to make it accessible and engaging for learners at all levels. The field is vast and constantly evolving, but with the right foundation, you can navigate the ever-expanding landscape of machine learning.

We believe that knowledge should be democratized, and this book is our contribution to that mission. Whether you are a student, an educator, or a professional in any domain, we hope this book equips you with the skills and insights necessary to thrive in the age of intelligent machines.

Embark on the journey within these pages, and explore the vast possibilities that Machine Learning offers. From predictive analytics to natural language processing and computer vision, the world of machine learning is at your fingertips. We're confident that this book will empower you to harness the power of data and algorithms to solve real-world problems and drive innovation in your chosen field.

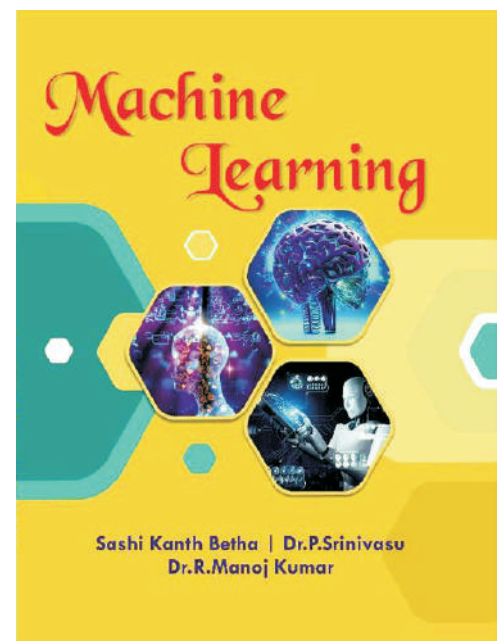
Details of the Book:

ISBN: 978-81-965752-8-1

Co-authors: Dr P Srinivasu & Dr R Manoj Kumar

Date of Publication: 10 October 2023

Publishers: Deccan International Academic Publishers, Tamil Nadu



Papers published in the Journals / Proceedings



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Scientific Officer F

Bhavini, DAE, Kalpakkam, Tamil Nadu

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Title of paper: Innovative Smart Network Enabled Charging Station for Future Electric Vehicle

Journal of The Institution of Engineers (India): Series B, Springer, 105(1), February 2024, pp 147- 156, Electronic ISSN 2250-2114, Print ISSN 2250-2106

DOI: <https://doi.org/10.1007/s40031-023-00961-5>

Co-authors: Alagumariyappan Paramasivam, Sankaran Vijayalakshmi, N Mahalingam & NM Gughan

Abstract: Renewable energy has become a major resource in the twenty-first century due to the excess usage of oil. The world is being transitioned to develop technology which uses renewable energy as its core element. The common renewable energy includes solar; wind, wave, geothermal. As technology develops, the Electric Vehicle became a demanding factor in the automobile sector. Increase in Electric vehicle production leads to the creation of the charging station. In this paper, a charging station is designed by utilizing the solar energy as a primary source. The primary focus of the charging station is the DC-DC converter which extracts energy from the PV Array. Further, the charging station detects the vehicle using YOLO v3 model and charge its battery. Additionally, the battery energy information in the charging station can be shared between other charging stations.

Keywords: Smart Charging Station; Electric Vehicle; IoT Object Detection; Converter; MPPT

Announcement

Elevate your status as a Certified Professional Engineers (PE) and International Professional Engineers (IntPE)

Professional Engineers (PE) Certification by IEI

Eligibility Requirement

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1. Hold a BE/BTech or equivalent degree recognized by a Statutory Authority or the Government of India.
2. Have accumulated five years or more of professional experience.
3. Be a member of a recognized professional engineering institution or association.
4. Maintain a satisfactory level of Continued Professional Development (CPD).

Please visit the following link :

https://www.ieindia.org/webui/IEI_PE_Certification.aspx

International Professional Engineers (IntPE) Certification by IEI

Eligibility Requirement

To be eligible for IntPE Certification by IEI, candidates must meet the following criteria:

1. Hold a BE/BTech or equivalent degree recognized by the Statutory Authority or the Government of India.
2. Possess seven years or more of professional experience.
3. Have a minimum of two years of professional experience in a significant engineering activity.
4. Be a member of a recognized professional engineering institution or association.
5. Maintain a satisfactory level of Continued Professional Development (CPD).

Please visit the following link:

https://www.ieindia.org/webui/IEI_IntPE_Certification.aspx

The eligible candidate can submit application in the prescribed format to:
The Deputy Director (Technical), The Institution of Engineers (India), 8 Gokhale Road, Kolkata 700020
For any query and assistance, please send email to: pe@ieindia.org

Publication by Members

Volume 9 | Issue 4 | April 2024



Er Jnan Ranjan Pal, FIE
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Title of paper: Estimation of Probable Maximum Flood by Flood Frequency Analysis at Tiuni Barrage Site on River Tons

Journal of The Institution of Engineers (India): Series A, Springer, 104(4), December 2023, pp 983-995, Electronic ISSN 2250-2157, Print ISSN 2250-2149

DOI: <https://doi.org/10.1007/s40030-023-00754-5>

Abstract: While planning and designing the hydraulic structures such as barrages, dams, reservoirs, spillways, tank embankments, bridges etc., proper safeguards must be made for the safe passage of the maximum peak flood expected. Many flood frequency methods are prevalent for estimating floods of various return periods. These methods are based on standard probability distribution functions. The assumption is that the annual maximum flood discharge at a certain location follows one of the standard probability distribution functions, for a catchment of a given region.

The main objective of this paper is to depict a methodology to calculate the maximum probable flood discharge at a Barrage Site, where historic maximum flood discharge data is not available, but it may be available at any site downstream. The methodology depicted in this paper is to first use Dicken's Formula to get peak flood discharge at the barrage site using the available data from downstream site, and then use the Gumbel's Method for the flood frequency analysis. The Gumbel's distribution or extreme value distribution is one of the commonly used distributions in India for flood frequency analysis and point rainfall frequency analysis.

This paper shows how the above methodology has been used to calculate the maximum probable flood discharge at Tiuni Barrage Site, where maximum flood discharge for 40 to 100 years is not available, but data available at the downstream Kishau Dam site has been used.

Using Gumbel's distribution, the calculated probable flood discharge for return period of 100 years is 5486 m³/sec and for return period of 1000 years is 7928 m³/sec, as shown in this paper can be used for Hydraulic Design and Structural design of Barrage at Tiuni respectively. Mean of annual flood peak for 37 years in the river is 1207 m³/sec, which is around a return period of about 2.25 years. This shows that the pattern of scatter is narrow in the graph of the Reduced Variate v/s annual flood peak in the river. Hence prediction of flood in the basin is nearly accurate and can be utilized in designing of important hydraulic structures and planning purposes.

Keywords: Barrage; Catchment; Dam; Discharge; Flood; Frequency; Geology; Hydrology; Hydroelectric; Himalayas; Reservoir

Announcement

Know-Your-Member (KYM)

The Institution of Engineers (India) is **updating the database of all its Corporate Members** along with their achievements for which a Know-Your-Member (KYM) form has been introduced.

Every Corporate Member is requested to kindly fill up the form and forward it along with the self-attested copy of photo ID proof to the address given below:-

The Deputy Director (Membership)
The Institution of Engineers (India), 8 Gokhale Road, Kolkata 700020
Email: datamemb@ieindia.org

The form can be accessed & downloaded at :

https://www.ieindia.org/WebUI/ajax/Downloads/WebUI_PDF/HIGHLIGHTS_DOCUMENT-3332.pdf



Prof Balachandran Ruthramurthy, FIE

Professor

Department of Electronics and Communication Engineering, School of Electrical Engineering and Computing, Adama Science and Technology University, P.O.Box No. 1888, Adama, Ethiopia

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Title of paper: Structural and Improved Dielectric Properties of Bismuth Pyrochlores Containing Interchangeable Ta⁵⁺ and Nb⁵⁺ Cations

Malaysian Journal of Chemistry, Malaysian Institute of Chemistry, 26(2), February 2024, pp 119-128, E-ISSN: 2550-1658

URL: <https://ikm.org.my/publications/malaysian-journal-of-chemistry/view-pdf.php?idx=J0049-0032ecc>

Co-authors: C C Khaw, PY Tan, K B Tan, H C Ananda Murthy, S K Chen, O J Lee & K Y Chan

Abstract: The pyrochlore structure demonstrates great structural flexibilities, compositional variables, and diverse electrical properties suitable for various electrical applications. This study aimed to synthesise novel pyrochlore phases with improved dielectric performance in the Nb-doped bismuth magnesium tantalate (BMT) system. A complete subsolidus solution was successfully prepared by solid-state reaction through a one-to-one replacement of Ta⁵⁺ by Nb⁵⁺ with the proposed chemical formula of (Bi_{3.50}Mg_{0.50})(Mg_{1.30}Nb_xTa_{2.70-x})O_{13.80} (0.00 ≤ x ≤ 2.70). Such doping mechanism implies that both isomorphous Nb⁵⁺ and Ta⁵⁺ are highly interchangeable due to their similar crystallo-chemical structures and ionic radii. The incorporation of Nb⁵⁺ into the BMT host structure resulted in the gradual increase of lattice parameters from 10.5610 (9) to 10.5809 (10) Å. The well-connected polyhedral grains in the range of 2.25–20.00 μm supported their average relative densities of above 80%. The Nb dopant was concluded to significantly enhance the dielectric performance of BMT pyrochlores, i.e., more than two-fold increase of dielectric constant, ε' from 81 to 195, while dielectric loss, tan δ is retained low in the order of 10⁻³.

Keywords: Pyrochlore; Dielectric Constant; Impedance; Niobium

Title of paper: Artificial Intelligence-Integrated Water Level Monitoring System for Flood Detection Enhancement

International Journal of Intelligent Systems and Applications in Engineering, 12(19s), March 2024, pp 336-340, ISSN 2147-679921

DOI: <https://ijisae.org/index.php/IJISAE/article/view/5071>

Co-authors: Kien-Fei Lee, Zi-Neng Ng, Kar-Ban Tan, Abraham Shiau-Iun Chong & Kah-Yoong Chan

Abstract: Flash floods are increasingly becoming a common disaster in Malaysia, triggered by a combination of natural and human-induced factors. The natural factors include climate changes, landforms due to the environmental impacts, while the human-induced factors are associated with the negligence in river conservation, clogged drainage, and polluted water retention systems due to industrial and domestic wastes. These factors affect the water levels in rivers and drainage systems, leading to potential flash floods once the danger mark is exceeded. Flash floods could result in severe property damage and even loss of lives. Considering the devastating impact of flash floods, it is imperative to develop an early warning system that facilitates timely remedial measures. This system could monitor the water levels in rivers and other water retention areas. Herein, this study aims to design a water level monitoring system using a cost-effective camera module powered by the Internet of Things (IoT). The system, which includes an ESP32-Camera module powered by a solar panel, captures the water level data using OpenCV at one-minute intervals. Then, the data are made available on IoT platforms like ThingSpeak, enabling the authorized parties to keep track of the critical water levels in water retention areas.

Keywords: Water Level Monitoring System; Internet of Things (IoT); ESP-32 Camera

Publication by Members

Volume 9 | Issue 4 | April 2024



Dr Somnath Mahato, MIE

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Title of paper: Potential of Satellite-Based Augmentation Systems (SBAS) in Test and Evaluation of Missiles in Indian Test Range Applications

Journal of the Indian Society of Remote Sensing, Springer, 51, December 2023, pp 2537–2547, Electronic ISSN 0974-3006, Print ISSN 0255-660X

DOI: <https://doi.org/10.1007/s12524-023-01787-w>

Co-authors: Mrinal Goswami, Rowdra Ghatak & Anindya Bose

Abstract: From the beginning of World War II, dual-axis tracking radars have played an important role in the tracking of missiles in test ranges. These radars operate mostly in S- or C-band of frequencies. However, these Radars have associated problems with the costly maintenance budget, various errors that creep into the data, and inter-radar bias correction. The modern-day global navigation satellite system (GNSS) together with space-based augmentation systems (SBAS) have provided scope to obtain internally generated and telemetered trajectory data from the missile under test (MUT) from the onboard GNSS receiver with SBAS capabilities within comparable or better accuracies. This research presents a comparison of the precession parameters of the MUT's position solutions between data from several tracking radars and those from the enhanced GNSS data. Also, experiments have been conducted using various satellite navigation constellations including NavIC and SBAS augmentation to demonstrate the improvement in accuracy and precession parameters applicable to the Indian scenario. To compete with the outcomes of contemporary satellite-based navigation system together with the augmentation systems for trajectory generation of cooperative missile targets, radar manufacturers must reconsider their design philosophies for usage on missile test ranges.

Keywords: Missile; GNSS; SBAS; GAGAN; Test Range; Precision



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Title of paper: Design, Fabrication, and Measurement of a Miniaturized MIMO Antenna Applicable for 5G Communication

International Journal of Microwave and Wireless Technologies, Cambridge University Press, January 2024, pp 1-12, ISSN: 1759-0787 (Print), 1759-0795 (Online)

DOI: <https://doi.org/10.1017/S1759078724000096>

Abstract: The design of low-profile Multiple-Input-Multiple-Output (MIMO) antennas for various 5G applications is a topic of huge interest in academia, research, and telecommunication sector. In this aspect, a compact and low-profile 5G MIMO antenna has been designed and analyzed for various 5G applications, specifically for the 24 GHz bands (24.25–24.45 GHz and 25.05–25.25 GHz) and local multipoint distribution system band (27.5–28.35 GHz) of the 5G spectrum. The proposed antenna structure is $20 \times 20 \times 1 \text{ mm}^3$ in dimension. Two spade-shaped radiators composed of Copper (annealed) material are placed orthogonally to improve isolation and maintain signal diversity. Rogers RT 5880 is used as the material for substrate. The antenna exhibits a wide bandwidth of 21.5–28.5 GHz. The mutual isolation $|S_{21}|$ has been maintained $\leq 29 \text{ dB}$ due to the insertion of a T-shaped parasitic strip in between the radiating elements. Novelty in design and superiority in performance has been observed when compared with related antenna categories.

Keywords: 5G Communication; Bandwidth; Enhanced Isolation; MIMO Antenna



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Title of paper: A Comparative Performance Analysis of Edge Detection in Hard Exudates and Cotton Wool Spots in Diabetic Retinopathy Fundus Images

3rd International Conference on Innovative Mechanisms for Industry Applications (ICIMIA), IEEE, December 2023, pp 1125-1133, Electronic ISBN:979-8-3503-4363-2, DVD ISBN:979-8-3503-4362-5, Print on Demand (PoD) ISBN:979-8-3503-4364-9

DOI: <https://doi.org/10.1109/ICIMIA60377.2023.10426599>

Co-authors: D Lahari, B Mounika, A Srividya & B Reshma

Abstract: The study of this paper addresses the growing concern in developing countries regarding Diabetic Retinopathy (DR) poses a significant threat to vision, necessitating early and accurate diagnosis. It investigates various edge detection operators for DR detection, aiming to identify optimal methods for precise edge localization. Retinal images, vital for diagnosis, often require manual scrutiny, leading to time constraints. Leveraging edge detection operators such as Sobel, Canny, Laplacian, Prewitt, Roberts Cross, and others. This research study evaluates their effectiveness in delineating retinal structures. Metrics including accuracy, precision, recall, F1 score, Mean Squared Error (MSE), and entropy are employed to assess the operator performance using defined threshold values. Through rigorous experimentation and analysis, it provides a comprehensive comparison of edge detection techniques and varying performance across operators and limitations in the context of DR diagnosis. By determining the optimal combination of metrics, this research identifies the best method for edge detection in DR applications. These results offer valuable insights for enhancing automated diagnostic processes, potentially revolutionizing the efficiency and accuracy of DR detection and providing significant benefits to both healthcare providers and patients.

Keywords: Diabetic Retinopathy; Edge Detection Operators; Retinal Images; Image Analysis; Optimal Methods; Retinal Structures

Title of paper: A Literature Survey on Classification of Electrocardiogram (ECG) Abnormalities

3rd International Conference on Innovative Mechanisms for Industry Applications (ICIMIA), IEEE, December 2023, pp 1439-1446, Electronic ISBN:979-8-3503-4363-2, DVD ISBN:979-8-3503-4362-5, Print on Demand (PoD) ISBN:979-8-3503-4364-9

DOI: <https://doi.org/10.1109/ICIMIA60377.2023.10426272>

Co-authors: K Sreya Sri, L Jyotshna, L Raji Naga Sai & PNikhita

Abstract: The ECG Signal is used in the field of cardiology to monitor and analyze the activity of the heart. This focuses on development and implementation of advanced machine learning algorithms and signal processing techniques for the automated classification and identification of abnormalities in ECG signals. The literature survey is the study of accuracy and efficiency of ECG analysis, thereby aiding healthcare professionals in the timely diagnosis and treatment of cardiovascular diseases. To achieve this, a comprehensive dataset of ECG recordings is collected and preprocessed to extract relevant data from the ECG signals. Feature extraction techniques such as wavelet-based features, frequency domain, and temporal domain are used. A variety of methods, including neural networks (NN), LDA, SVM, KNN, decision trees, and Bayesian classifiers, have been employed to organize ECG signals. In order to diagnose arrhythmias, a two-dimensional CNN model is used for ECG signal classification, with the help of CNN's LSTM. Deep learning has recently gained a lot of popularity and been effectively used for the classification of heart disease and arrhythmia, ST segment or classification of heartbeat. A variety of machine learning models, such as RNNs, HRNNs and ensemble techniques are trained and evaluated for their performance in classifying ECG signals into different categories, including normal rhythms and various cardiac arrhythmias. Additionally, anomaly detection algorithms are employed to identify subtle deviations from normal ECG patterns. The literature survey results studied from this research have the potential to enhance patient care by enabling early detection of cardiac abnormalities, leading to more timely interventions and improved clinical outcomes. Furthermore, the methodology explained in this survey can be applied to other areas of medical signal analysis, paving the way for more efficient and reliable diagnostic tools in the field of healthcare. The primary goals of this study are to categorize ECG signals and identify abnormalities using various techniques.

Keywords: Electrocardiogram; Machine Learning Algorithms; Support Vector Machine (SVM); Recurrent Neural Networks (RNNs); Convolutional Neural Networks (CNNs); Handcrafted-Rule-enhanced Neural Network (HRNN); Arrhythmia

Publication by Members

Volume 9 | Issue 4 | April 2024



Er Ebin PM, AMIE

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Title of paper: A Novel Approach to Identify Diabetic Macular Edema Using a Minimal CNN Model

1st International Conference on Optimization Techniques for Learning (ICOTL), IEEE, February 2024, Electronic ISBN:979-8-3503-2804-2, Print on Demand (PoD) ISBN:979-8-3503-2805-9

DOI: <https://doi.org/10.1109/ICOTL59758.2023.10435002>

Co-authors: Athira B Kaimal; U Ananthanagu; Annie Sujith; Shanthala PT & Deepti C

Abstract: DME ranks among the primary factors behind the decline in eyesight among individuals with diabetes, and Prompt identification can aid in avoiding irreversible damage. However, current DME detection methods rely on complex and computationally intensive models, making them unfit for widespread use. This study aims to develop a novel Minimal Convolutional Neural Network (MCNN) framework for the early identification of Diabetic Macular Edema (DME) in medical Photographs. The proposed minimal CNN model uses a smaller number of convolutional layers and filters than conventional models while achieving comparable or better Accomplishment. The training of the model involves a substantial collection of retinal images from both patients with and without DME. The outcomes demonstrate that the proposed work can accurately detect DME with high sensitivity and specificity, providing a promising tool for early diagnosis and effective management of the condition. The novel approach presented in this study achieved an accuracy of 91.14%.

Keywords: CNN; DME; Deep Learning; MCNN



Er Pritesh Pawan Jain, AMIE

Team Lead

Tata Technologies, Pune, Maharashtra

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Title of paper: A Smart Transportation System for Existing Vehicles and Roads Infrastructure to Ease Traffic and Toll Problems in India

Symposium on International Automotive Technology, SAE International, January 2024, ISSN: 0148-7191, e-ISSN: 2688-3627

DOI: <https://doi.org/10.4271/2024-26-0181>

Abstract: India is a highly populous country. The traffic problems faced by the people here are not uncommon. The increase in traffic leads to increase in accidents, pollution, inconvenience and frustration. It also comes with costs of additional fuel and time.

Though public transport is extensively available in India, still it isn't sufficient for the population of India. Especially in Metro cities, public transport services are often crowded. So, to travel peacefully people are opting for commuting in their own vehicles. And as a result, more vehicles are coming on roads. Other major reasons for increasing traffic are lack of proper implementation of traffic rules and traffic signals out of sync.

In addition to city traffic, congestion is also seen on highways, mainly at toll plazas. Although implementation of FASTag has reduced it to some extent, some toll plazas still face traffic congestion issues.

This paper provides an idea to ease the traffic problems in the city and on the highways too. The system is a low cost, all-in-one model which will provide benefits like proper implementation of traffic rules, road monitoring and hence smooth movement of traffic, automating fine collections, improved road safety and even vehicle tracking by authorities to prevent crime. This system also helps in ease of toll collection with no need of vehicles to stop on toll plazas. This further helps to eliminate toll plazas and enable direct toll collection based on distance travelled.

Keywords: Intelligent Transportation Systems; Public Transportation Systems; Traffic Management; Congestion

Published Articles in IET Journals

Volume 9 | Issue 4 | April 2024



Journal of The Institution of Engineers (India): Series B

[Computer, Electrical, Electronics & Telecommunication Engineering]

(Electronic ISSN: 2250-2114; Print ISSN: 2250-2106)

[CiteScore: 2.2; h5 Index: 19]

[SCOPUS Indexed & UGC-CARE (India) listed]

For download, use Membership ID through: www.ieindia.org

Volume 105, Issue 2, April 2024

Title: **A Parallel DNA Crypto Algorithm for Medical Image**

Authors: **Sumangala Biradar, Prema T Akkasaligar & Sunanda Biradar**

Department of Information Science and Engineering, BLDEA's V.P. Dr. P. G. Halakatti College of Engineering and Technology, Vijayapur, Karnataka, 586103, India

Department of Computer Science and Engineering, KLE Technological University's Dr. M.S. Sheshgiri College of Engineering and Technology, Belagavi Campus, Belgaum, Karnataka, 590006, India

Department of Computer Science and Engineering (Artificial Intelligence and Machine Learning), BLDEA's V.P. Dr. P. G. Halakatti College of Engineering and Technology, Vijayapur, Karnataka, 586103, India

DOI: <https://doi.org/10.1007/s40031-023-00962-4>

Publication date: 21 December 2023

Pages: 183 - 190

Title: **Automatic Location Tracking and Health Monitoring by System Based on Mesh Network**

Authors: **Rachit Bansal, Sudhanshu Mahajan, Kanish Aggarwal, Deepak Goyal, Yug Choudhary, Kanwarpreet Kaur & Neeru Jindal**

ECED, TIET, Patiala, Punjab, India

DOI: <https://doi.org/10.1007/s40031-023-00979-9>

Publication date: 20 January 2024

Page: 191 - 202

Announcement

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Published Articles in IET Journals

Volume 9 | Issue 4 | April 2024

- Title: **A Flow-Based Performance Evaluation on RYU SDN Controller**
Authors: **Anil Ram, Manash Pratim Dutta & Swarnendu Kumar Chakraborty**
Department of Computer Science and Engineering, NIT Jote, Jote, Itanagar, Arunachal Pradesh, 791113, India
Department of Computer Science and Information Technology, Cotton University, Pan Bazaar, Guwahati, Assam, 781001, India
DOI: <https://doi.org/10.1007/s40031-023-00982-0>
Publication date: 30 January 2024
Page: 203 - 215
- Title: **Combined Wavelet and Ann-Based Open-Switch Fault Detection and Classification in PV-Fed Multilevel Inverter**
Authors: **Vikram Singh, Anamika Yadav & Shubhrata Gupta**
Department of Electrical Engineering, National Institute of Technology, Raipur, CG, India
DOI: <https://doi.org/10.1007/s40031-023-00964-2>
Publication date: 22 December 2023
Pages: 217 - 228
- Title: **Design a High Frequency Power Inverter Using Ferrite-Core Transformer for Ohmic Heating of Liquid Conducting System**
Authors: **Subrata Mandal & Madhab Roy**
Electrical Engineering Department, Jadavpur University, Kolkata, India
UHT Lab, Electrical Engineering Department, Jadavpur University, Kolkata, India
DOI: <https://doi.org/10.1007/s40031-023-00974-0>
Publication date: 22 January 2024
Pages: 229 - 237
- Title: **Design & Implementation of High Speed and Low Power PLL Using GPKD 45 nm Technology**
Authors: **Narayan A Badiger & Sridhar Iyer**
Department of ECE, S. G. Balekundri Institute of Technology, Shivabasava Nagar, Belagavi, Karnataka, 590010, India
Department of CSE (AI), KLE Technological University, Dr. MSSCET, Belagavi, Karnataka, India
DOI: <https://doi.org/10.1007/s40031-023-00978-w>
Publication date: 22 January 2024
Pages: 239 - 249
- Title: **Early Malignant Mesothelioma Detection Using Ensemble of Naive Bayes Under Decorate Ensemble Framework**
Authors: **Akash Moirangthem, Olive Simick Lepcha, Ranjit Panigrahi, Biswajit Brahma & Akash Kumar Bhoi**
Department of Computer Applications, Sikkim Manipal Institute of Technology, Sikkim Manipal University, Gangtok, India
McKesson Corporation, 1 Post St, San Francisco, CA, 94104, USA
Directorate of Research, Sikkim Manipal University, Gangtok, Sikkim, 737102, India
DOI: <https://doi.org/10.1007/s40031-023-00988-8>
Publication date: 28 January 2024
Pages: 251 - 264
- Title: **Feature Extraction of Partial Discharge Signal Based on Local Mean Decomposition and Multi-scale Singular Spectrum Entropy**

- Authors: **Xinlu Yang, Wenbo Wang, Ming Fang, Long Hu & Liting Li**
Hubei Province Key Laboratory of System Science in Metallurgical Process, Wuhan, 430065, China
Guangzhou Power Supply Bureau of Guangdong Grid Co, Guangdong, 510600, China
Zhongguancun No.2 Primary School, Beijing, 100190, China
- DOI: <https://doi.org/10.1007/s40031-023-00981-1>
- Publication date: 19 January 2024
- Pages: 265 - 275
- Title: **Investigations into the Poor Energy use Practices of Irrigation Pumps by Indian Farmers: A Case Study**
- Authors: **Mahesh N Shelar, Vilas K Matsagar, Vijay S Patil & Sanjay D Barahate**
Department of Mechanical Engineering, KKWIEER, Nashik, MS, 422003, India
- DOI: <https://doi.org/10.1007/s40031-023-00977-x>
- Publication date: 29 January 2024
- Pages: 277 - 283
- Title: **Krishiq-BERT: A Few-Shot Setting BERT Model to Answer Agricultural-Related Questions in the Kannada Language**
- Authors: **Pratijnya Ajawan, Veena Desai, Shreya Kale & Sachingouda Patil**
Department of ECE, KLSGIT, Belagavi, Karnataka, India
- DOI: <https://doi.org/10.1007/s40031-023-00952-6>
- Publication date: 16 January 2024
- Pages: 285 - 296
- Title: **Microgrid Harmonic-Restrained Dual Slope Differential Protection**
- Author: **Jigneshkumar Pramodbhai Desai**
Department of Electrical Engineering, U V Patel College of Engineering, Ganpat University, Mehsana, 384012, India
- DOI: <https://doi.org/10.1007/s40031-023-00976-y>
- Publication date: 23 January 2024
- Pages: 297 - 308
- Title: **PV-Based Grid Integrated EV with GWO Optimized PI Controller for Boost Integrated Luo Converter**
- Authors: **Ananda Babu Kancherla, N Bhanu Prasad & D Ravi Kishore**
Department of Electrical and Electronics Engineering, Gandhi Institute of Engineering and Technology, Gunpur, Odisha, India
Department of Electrical and Electronics Engineering, Godavari Institute of Engineering and Technology, Rajahmundry, A.P., India
- DOI: <https://doi.org/10.1007/s40031-023-00968-y>
- Publication date: 23 December 2023
- Pages: 309 - 321
- Title: **Power Efficient CNTFET-Based Ternary Comparators**
- Authors: **Katyayani Chauhan & Deepika Bansal**
Manipal University - Jaipur Campus, Jaipur, India
- DOI: <https://doi.org/10.1007/s40031-023-00972-2>
- Publication date: 29 December 2023
- Pages: 323 - 334

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- Title: **PV-Fed Single-Phase Induction Motor for Irrigation Application**
Authors: **Dawda Bojang, Eleyde Nhantumbo, Monika Verma & Ashish Kulkarni**
Department of Electrical Engineering, Delhi Technological University, Shahbad Extension, Delhi, Delhi, 110042, India
DOI: <https://doi.org/10.1007/s40031-023-00975-z>
Publication date: 10 January 2024
Pages: 335 - 342
- Title: **Seismic Vibration Analysis Using Toeplitz-Matrix-Based Cloud Computing**
Authors: **Aniruddha Das, Surajit Chattopadhyay & Jan Harm C Pretorius**
Department of Civil Engineering, Indian Institute of Technology, Kanpur, Kanpur, India
Department of Electrical Engineering, GKCIET, Malda, India
Postgraduate School of Engineering Management, University of Johannesburg, Johannesburg, South Africa
DOI: <https://doi.org/10.1007/s40031-023-00965-1>
Publication date: 23 December 2023
Pages: 343 - 349
- Title: **S4BL Power-Factor-Corrected Converter Powered Sensorless BLDC Motor Ceiling-Fan**
Authors: **Amit Kumar & Bhim Singh**
Department of Electrical Engineering, Indian Institute of Technology, Delhi, Hauz Khas, New Delhi, 110016, India
DOI: <https://doi.org/10.1007/s40031-023-00969-x>
Publication date: 12 January 2024
Pages: 351 - 364
- Title: **Underwater Fleck Detection Using Convolutional Neural Network**
Authors: **S Pushpa Mala, P Prajwal Raju, B Poojashree, Raghaveshwara Hebbar, Vineet Bedre & K R Manasa**
Department of Electronics and Communication Engineering, Dayananda Sagar University, Kudlu Gate, Bengaluru, Karnataka, 560100, India
DOI: <https://doi.org/10.1007/s40031-023-00949-1>
Publication date: 28 November 2023
Pages: 365 - 373
- Title: **Wireless Geofenced Inventory Management for Agricultural Warehouse**
Authors: **P Arishenbagam, S Tamil Selvi & B Ganapathy Ram**
Department of ECE, National Engineering College, Kovilpatti, India
DOI: <https://doi.org/10.1007/s40031-023-00967-z>
Publication date: 24 December 2023
Pages: 375 - 383
- Title: **Architectures for Efficiency Enhancement in Power Amplifiers**
Authors: **Kumar Saurabh & Sukwinder Singh**
Department of Electronics and Communication, Dr. B R Ambedkar National Institute of Technology, Jalandhar, 144008, Punjab, India
DOI: <https://doi.org/10.1007/s40031-023-00951-7>
Publication date: 08 December 2023
Pages: 385 - 396

Title: **Multi-input Converters for Electric Vehicles: A Comprehensive Review of Topologies, Control Strategies, and Future Research Trends**

Authors: **Ayyarao S L V Tummala, G Indira Kishore, V Tarun, K Vinay & S Sriharsha**

GMR Institute of Technology, Rajam, 532127, India

DOI: <https://doi.org/10.1007/s40031-023-00971-3>

Publication date: 29 December 2023

Pages: 397 - 416

Title: **Knowledge Extraction on Energy Consumption in an Educational Institution Using Smart Energy Meter Data Analytics**

Authors: **A C Vishnu Dharssini, S Charles Raja & D Nelson Jayakumar**

Department of Electrical and Electronics Engineering, Thiagarajar College of Engineering, Madurai, Tamil Nadu, India

DOI: <https://doi.org/10.1007/s40031-023-00963-3>

Publication date: 21 December 2023

Pages: 417 - 431

Title: **Investigation of NOMA 5G Systems Under Non-Gaussian Channels**

Author: **Hasan Abu Hilal**

Higher Colleges of Technology, HCT_ADM_ELE, Abu Dhabi, UAE

DOI: <https://doi.org/10.1007/s40031-023-00955-3>

Publication date: 02 December 2023

Pages: 433 - 441

Title: **Using Computer Vision for Mango Price Estimation Based on Breed Classification and Quality Grading**

Authors: **Chonthanya Yosbuth, Kittipat Pattarajariya, Panumas Sitthikarn, Saran Ditjarern & Thitirat Siriborvornratanakul**

Graduate School of Applied Statistics, National Institute of Development Administration (NIDA), 148 SeriThai Rd., Bangkapi, Bangkok, 10240, Thailand

DOI: <https://doi.org/10.1007/s40031-023-00970-4>

Publication date: 06 January 2024

Pages: 443 - 454

Title: **Correction: Characterization of Tin Disulfide Thin Films Prepared by Spin Coating Technique: Effect of Spin Speed and Deposition Time on Film Properties**

Authors: **Kazi Hanium Maria, Rezaul Md Kabir, I N Esha, F T Z Toma, M S Bashar & Kazi Md Amjad Hussain**

Department of Physics, University of Dhaka, Dhaka, 1000, Bangladesh

Experimental Physics Division, Atomic Energy Centre, Dhaka, 1000, Bangladesh

Bangladesh Council of Scientific and Industrial Research (BCSIR), Dhaka, 1205, Bangladesh

DOI: <https://doi.org/10.1007/s40031-023-00984-y>

Correction date: 11 January 2024

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Volume 105, Issue 1, February 2024

Title: **Analyzing the Influence of Microstructure on the Mechanical Properties of Mig Welded Similar and Dissimilar Joints Between AISI-304 and Inconel 718 Plates**

Authors: **Aarav Shrenik Dodhia, Jhashanka Dadhich, Divjyot Singh, Revanur Srinivas Sidhartha Sarma & Saurabh Dewangan**

Department of Mechanical Engineering, Manipal University Jaipur, Jaipur, Rajasthan, 303007, India

DOI: <https://doi.org/10.1007/s40032-023-01022-y>

Publication date: 03 January 2024

Pages: 1 - 15

Title: **Constructal Solid and Perforated Fin Installation in a Combined Microchannel Heat Sink for Maximum Heat Transfer**

Author: **N Y Godi**

Department of Mechanical Engineering, University of Cape Town, Private Bag X3, Rondebosch, 7701, South Africa

DOI: <https://doi.org/10.1007/s40032-023-01006-y>

Publication date: 03 January 2024

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Title: **Design, Development, and Analysis of Ultrasonic Fall Rate Measuring System for Primary Pressure Standard**

Authors: **Rahul Kumar, Kalpana Yadav, P K Dubey, Afaqul Zafer, Ashok Kumar & Sanjay Yadav**

Pressure, Vacuum and Ultrasonic Metrology, Division of Physico-Mechanical Metrology, CSIR-National Physical Laboratory, Dr. K. S. Krishnan Marg, New Delhi, 110012, India
Academy of Scientific and Innovative Research (AcSIR), Ghaziabad, 201002, India

DOI: <https://doi.org/10.1007/s40032-023-01019-7>

Publication date: 05 January 2024

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Title: **Study on Effects of Flow Rate of Coolant During CO₂-Assisted MQL Turning of EN31 Steel**

Authors: **Sutanu Misra, Yogesh Kumar & Goutam Paul**

Department of Mechanical Engineering, University of Engineering and Management Kolkata, Kolkata, India
Department of Mechanical Engineering, National Institute of Technology Patna, Patna, Bihar, India

DOI: <https://doi.org/10.1007/s40032-023-01011-1>

Publication date: 14 November 2023

Pages: 41 - 57

- Title: **Effect on Different Anatomy Layers of Human Subject During Vibration Conditions Using FEM**
Authors: **Shubham Sharma, Sachin Kalsi, Jagjit Singh, Ishbir Singh & Rohit Kumar**
Department of Mechanical Engineering, Chandigarh University, Mohali, India
Department of Mechanical Engineering, Indus University, Ahmedabad, India
DOI: <https://doi.org/10.1007/s40032-023-01023-x>
Publication date: 31 December 2023
Pages: 59 - 68
- Title: **Experimental and Numerical Investigation of Effect of Melter Temperature and Casting Speed on Pull-In (Concavity) of AA1050 Ingot During Direct Chill Casting**
Authors: **Ritesh Fegade, Rajendrakumar Tated & Rupendra Nehete**
Department of Mechanical Engineering, Genba Sopanrao Moze College of Engineering, Balewadi, Pune, India
Department of Mechanical Engineering, SNJB's Late Sau Kantabai Bhavarlalji Jain College of Engineering, Chandwad, India
Department of Mechanical Engineering, SIES Graduate School of Technology, Navi, Mumbai, India
DOI: <https://doi.org/10.1007/s40032-023-01018-8>
Publication date: 05 January 2024
Pages: 69 - 79
- Title: **Geographical Information System (GIS)-Based Solar Photovoltaic Farm Site Suitability Using Multi-criteria Approach (MCA) in Southern Tamilnadu, India**
Authors: **Vivek Vasudevan, Edison Gundabattini & S. Darius Gnanaraj**
OLITEC Solar Energy, Vellore, 632520, Tamil Nadu, India
Department of Thermal and Energy Engineering, School of Mechanical Engineering, Vellore Institute of Technology (VIT), Tamil Nadu, Vellore, 632 014, India
Department of Design and Automation, School of Mechanical Engineering, Vellore Institute of Technology (VIT), Tamil Nadu, Vellore, 632 014, India
DOI: <https://doi.org/10.1007/s40032-023-01001-3>
Publication date: 09 November 2023
Pages: 81 - 99
- Title: **Off-Design Performance Simulation of Non-mixed Twin-Spool Aero Turbine Engine**
Authors: **Saeed Jafaripناه, Fathollah Ommi & Zoheir Saboohi**
Tarbiat Modares University, Tehran, Iran
Khayyam Research Institute, Ministry of Science, Research, and Technology, Tehran, Iran
DOI: <https://doi.org/10.1007/s40032-023-01002-2>
Publication date: 11 November 2023
Pages: 101 - 114
- Title: **Role of CNTs on the Resistance to Delamination Growth in Three-Phase FRP Laminates with Embedded Delamination: Finite Element Analysis**
Authors: **Chukka Atchuta Rao, K S R K Murthy & D Chakraborty**
Mechanical Engineering Department, IIT Guwahati, Guwahati, 781039, India
DOI: <https://doi.org/10.1007/s40032-023-01014-y>
Publication date: 02 December 2023
Pages: 115 - 126
- Title: **Rolling Element Bearing Fault Investigation Based on Translation Invariant Wavelet Means**

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- Denosing and Empirical Mode Decomposition (EMD)**
Authors: **Arvind Singh Tomar & Pratesh Jayaswal**
Department of Mechanical Engineering, Madhav Institute of Technology and Science, Gwalior, Madhya Pradesh, India
DOI: <https://doi.org/10.1007/s40032-023-01016-w>
Publication date: 09 January 2024
Pages: 127 - 140
- Structural Synthesis of Planar Kinematic Chains and Their Detection of Isomorphism**
Authors: **Sayed Ahamad, Sabah Khan & Aas Mohammad**
Department of Mechanical Engineering, Jamia Milia Islamia, Central University, New Delhi, India
DOI: <https://doi.org/10.1007/s40032-023-01012-0>
Publication date: 27 January 2024
Pages: 141 - 159
- Study of the Step Climbing Ability of a Rover with Rocker Bogie Mechanism**
Authors: **Manav Mepani & Anirban Guha**
Department of Mechanical Engineering, IIT Bombay, Mumbai, 400076, India
DOI: <https://doi.org/10.1007/s40032-023-01021-z>
Publication date: 08 January 2024
Pages: 161 - 177
- Synthesis and Characterization of Mg and Ti Co-Doped Bismuth Ferrite for Piezoelectric Application**
Authors: **Pratim Das & Ranit Karmakar**
Department of Metallurgical and Materials Engineering, Indian Institute of Technology Kharagpur, Kharagpur, West Bengal, 721 302, India
DOI: <https://doi.org/10.1007/s40032-023-01020-0>
Publication date: 03 January 2024
Pages: 179 - 186
- Traction Separation Curve Determination for CP Ti-2 Using the EWF Approach**
Authors: **Khushbu Panchal & Chaitanya Desai**
Department of Mechanical Engineering, S. V. M. Institute of Technology, Bharuch, 392001, Gujarat, India
Department of Mechanical Engineering, C. K. Pithawala College of Engineering and Technology, Surat, 395007, Gujarat, India
DOI: <https://doi.org/10.1007/s40032-023-01003-1>
Publication date: 30 November 2023
Pages: 187 - 194
- Workspace Analysis of Calibrated Multi-position Synthesized 3-Prismatic-Revolute-Spherical Manipulator**
Author: **Srinivasa Rao Pundru**
Department of Mechanical Engineering, Mahatma Gandhi Institute of Technology, C.B.I.T (Post), Gandipet, Hyderabad, Telangana State, 500075, India
DOI: <https://doi.org/10.1007/s40032-023-01017-9>
Publication date: 21 January 2024
Pages: 195 - 214

- Title: **Grooves and Cross Section Effects on Energy Absorption of S-Shaped Tubes Under Axial Quasi-Static and Impact Loading**
Authors: **Erfan Soheili & Saeed Feli**
DOI: <https://doi.org/10.1007/s40032-023-01010-2>
Publication date: December 2023
Pages: 215 - 232
- Title: **Instruments for Addressing Climate Change in Renewable Energy Policy of India: A Review of Developments in Policy Research**
Authors: **Anil Kumar Joshi & C M S Negi**
DOI: <https://doi.org/10.1007/s40032-023-01004-0>
Publication date: 18 November 2023
Pages: 233 - 240
- Title: **Review on Efforts to Improve the Mechanical Performance of Fiber-Reinforced Polymer (FRP) Composites Under the Marine Environment**
Authors: **Praful Choudhari, Vivek Kulkarni & Sanjeevakumar Khandal**
DOI: <https://doi.org/10.1007/s40032-023-01009-9>
Publication date: 23 November 2023
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Volume 105, Issue 1, April 2024

- Title:** **Homogeneous and Heterogeneous Modeling of Patient-Specific Hip Implant Under Static and Dynamic Loading Condition Using Finite Element Analysis**
- Authors:** **Ravikant, Vinod Kumar Mittal & Vikas Gupta**
Department of Mechanical Engineering, National Institute of Technology, Kurukshetra, 136119, India
Department of Mechanical Engineering, Ch. Devi Lal State Institute of Engineering & Technology, Panniwala Mota, 125077, India
- DOI:** <https://doi.org/10.1007/s40033-023-00447-0>
- Publication date:** 23 January 2023
- Pages:** 1 - 20
- Title:** **Thermal Conductivity of Hot-Rolled Al7075/TiB₂/Graphite Hybrid MMCs**
- Authors:** **T Hemanth Raju, Manjunatha, G Saravanakumar, Suresh Erannagari, T Jagadeesha & Amithkumar Gajakosh**
Department of Mechanical Engineering, New Horizon College of Engineering, Bengaluru 560103, India
Department of Mechanical Engineering, BMS College of Engineering, Bengaluru 560019, India
Department of Mechanical Engineering, National Institute of Technology, Calicut, Kerala 673601, India
Department of Mechanical Engineering, BTL Institute of Technology and Management, Bengaluru, 560099, India
- DOI:** <https://doi.org/10.1007/s40033-023-00448-z>
- Publication date:** 06 February 2023
- Page:** 21 - 32
- Title:** **Influence of Carbon Nano fibre Addition on Mechanical Behaviour of PLA Based 3D Printed Polymer Nano Composites**
- Authors:** **N Hemanth Kumar, H Adarsha, R Keshavamurthy & N Kapilan**
Department of Mechanical Engineering, Nitte Meenakshi Institute of Technology, Bangalore, Karnataka, India
Department of Mechanical Engineering, Jain University, Bangalore, India
Department of Mechanical Engineering, Dayananda Sagar College of Engineering, Bangalore, Karnataka, India
- DOI:** <https://doi.org/10.1007/s40033-023-00455-0>
- Publication date:** 20 February 2023
- Page:** 33 - 47
- Title:** **Multi-objective Optimization of FDM Using Hybrid Genetic Algorithm-Based Multi-criteria**

- Decision-Making (MCDM) Techniques**
Authors: **Satish Chinchankar, Sourabh Shinde, Avez Shaikh, Vaibhav Gaikwad & N H Ambhore**
Vishwakarma Institute of Information Technology, Pune, Maharashtra, India
College of Engineering Pune, Pune, Maharashtra, India
K K Wagh Institute of Engineering Education and Research, Nashik, Maharashtra, India
DOI: <https://doi.org/10.1007/s40033-023-00459-w>
Publication date: 21 February 2023
Pages: 49 - 63
- Stress Analysis of Single Lap Joint Using Al 6063 and GFRP as Adherents with Bond 108 as Adhesive**
Authors: **N. Nithesh Bhaskar & M K Venkatesh**
Mechanical Engineering Department, Dayananda Sagar College of Engineering, Bangalore, India
DOI: <https://doi.org/10.1007/s40033-023-00452-3>
Publication date: 22 February 2023
Pages: 65 - 76
- Availability Optimization of a Dragline Subsystem using Bayesian Network**
Authors: **Debasis Jana, Deepak Kumar, Suprakash Gupta & Kisan Kumar Gupta**
Indian Institute of Technology (BHU), Varanasi, 221005, India
DOI: <https://doi.org/10.1007/s40033-023-00457-y>
Publication date: 22 February 2023
Pages: 77 - 88
- Impact of Processing Variables on Formability of AA7079 Sheet by SPIF Technique**
Authors: **Govind Panwar, Dinesh Khanduja & Vikas Upadhyay**
Mechanical Engineering Department, National Institute of Technology, Kurukshetra, Kurukshetra, India
Mechanical Engineering Department, National Institute of Technology, Patna, India
DOI: <https://doi.org/10.1007/s40033-023-00450-5>
Publication date: 23 February 2023
Pages: 89 - 96
- Development of Rice Husk and Sawdust Mycelium-Based Bio-composites: Optimization of Mechanical, Physical and Thermal Properties**
Authors: **Herman Mbabali, Michael Lubwama, Vianney Andrew Yiga, Evans Were & Hillary Kasedde**
Department of Mechanical Engineering, Makerere University, P.O. Box 7062, Kampala, Uganda
Africa Center of Excellence in Materials, Product Development and Nanotechnology, Makerere University, P.O. Box 7062, Kampala, Uganda
Institute of Agricultural Sciences in the Tropics (Hans-Ruthenberg-Institute), University of Hohenheim, Garbenstr. 13, 70599, Stuttgart, Germany
DOI: <https://doi.org/10.1007/s40033-023-00458-x>
Publication date: 24 February 2023
Pages: 97 - 117
- A Case Study on Economic Impact Assessment of Developing Single Drill Level in Sublevel Stopping Method**
Authors: **Gopinath Samanta, Suranjan Sinha & Tapan Dey**
Process Technology Group, Tata Steel Ltd., Jamshedpur, 831001, India
Department of Mining Engineering, Bengal Engineering and Science University, Shibpur, 711103,

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- India
Data and Analytics, TCS, Kolkata, 700156, India
DOI: <https://doi.org/10.1007/s40033-023-00453-2>
Publication date: 28 February 2023
Pages: 119 - 125
- Title: **An Experimental Study on High-Speed Milling of Super Duplex Stainless Steel and to Investigate the Effect of Cutting Parameters on Surface Roughness**
Authors: **L Janardhan, K Chandrappa & R Suresh**
Mechanical Engineering Department, Siddaganga Institute of Technology, Tumkur, Karnataka, 572103, India
Mechanical Engineering Department, M S Ramaiah University of Applied Sciences, Bangalore, Karnataka, 560058, India
DOI: <https://doi.org/10.1007/s40033-023-00456-z>
Publication date: 28 February 2023
Pages: 127 - 132
- Title: **Fabrication and Mechanical Analysis of Nanoclay Reinforced PLA Composite Developed by Fused Filament Fabrication**
Authors: **Satyabodh Raichur & R Ravishankar**
Department of Mechanical Engineering, APS College of Engineering, Bangalore, India
Department of Mechanical Engineering, SJCE, Mysuru, India
DOI: <https://doi.org/10.1007/s40033-023-00462-1>
Publication date: 01 March 2023
Pages: 133 - 140
- Title: **A Minor Wettability Study on TiO₂ Nanotubes over Ti-alloy Fabricated in Different Electrolytes**
Authors: **Shashank Poddar, Arindam Bit & Sudip K Sinha**
Department of Metallurgical and Materials Engineering, National Institute of Technology, Raipur, 492010, India
Department of Biomedical Engineering, National Institute of Technology, Raipur, 492010, India
DOI: <https://doi.org/10.1007/s40033-023-00463-0>
Publication date: 02 March 2023
Pages: 141 - 145
- Title: **Polyvinylidene Difluoride/Sb₂S₃ Composite Film as a Potential Candidate for Piezoelectric Energy Generation**
Authors: **Apurba Baral & Nillohit Mukherjee**
School of Advanced Materials, Green Energy and Sensor Systems, Indian Institute of Engineering Science and Technology, Shibpur, Botanic Garden, Howrah, 711103, West Bengal, India
DOI: <https://doi.org/10.1007/s40033-023-00467-w>
Publication date: 03 March 2023
Pages: 147 - 153
- Title: **Machining Performance Characteristics of Ti-6Al-4V Alloy Due to Ultrasonic Assisted Micro-EDM Using Rotating Tool Electrode**
Authors: **Param Singh, Vinod Yadava & Audhesh Narayan**
Department of Mechanical Engineering, National Institute of Technology Hamirpur, Hamirpur, 177005, India

- Department of Mechanical Engineering, Motilal Nehru National Institute of Technology Allahabad, Prayagraj, 211004, India
DOI: <https://doi.org/10.1007/s40033-023-00460-3>
Publication date: 06 March 2023
Pages: 155 - 171
- Title: **Cost-effective Polyurethane Monocoat Painting System for Freight Using Direct-to-Metal Method**
Authors: **Apurba Das & Adil Wazeer**
Titagarh Wagons Ltd, 756 Anandapur, Kolkata, 700107, India
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School of Laser Science and Engineering, Jadavpur University, Kolkata, 700032, India
DOI: <https://doi.org/10.1007/s40033-023-00461-2>
Publication date: 06 March 2023
Pages: 173 - 182
- Title: **Study on Drying Behavior of Hydratable Alumina-bonded High-Alumina Castables by Addition of Different Organic Fibers**
Authors: **Pawan Rangdal, Sharanabasappa B Patil & Poornanand Hiremath**
Department of Ceramics and Cement Technology, PDA College of Engineering, Aiwan-E-Shahi Area, Kalaburgi, Karnataka, 585102, India
DOI: <https://doi.org/10.1007/s40033-023-00468-9>
Publication date: 11 March 2023
Pages: 183 - 189
- Title: **Effect of Cooling-Assisted Friction Stir Processing on Corrosion Behavior of AA5083 Alloy**
Authors: **B V S Keerthana, M V N V Satyanarayana & M N S Shankar**
Visvesvarayya Technological University, Belgaum, Karnataka, India
Anil Neerukonda Institute of Technology and Sciences, Visakhapatnam, Andhrapradesh, India
DOI: <https://doi.org/10.1007/s40033-023-00470-1>
Publication date: 16 March 2023
Pages: 191 - 200
- Title: **Development of Thick-Section Commercially Pure Titanium Welds using Gas Tungsten Arc Welding Process**
Authors: **G Harikrishna, A H V Pavan, M Swamy & R Sri Rama Devi**
Welding Engineering Division, HPEP, BHEL Ramachandrapuram, Hyderabad, 502032, India
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Metallurgical Engineering, JNTUH College of Engineering Hyderabad, Kukatpally, Hyderabad, 500085, India
DOI: <https://doi.org/10.1007/s40033-023-00466-x>
Publication date: 20 March 2023
Pages: 201 - 210
- Title: **Effect of Tool Pin Geometries on Weld Quality of Al/Cu Dissimilar Friction Stir Welding**
Authors: **Abhishek Mandal, John Deb Barma & Gautam Majumdar**
Department of Mechanical Engineering, Jadavpur University, Kolkata, West Bengal, 700032, India
Department of Mechanical Engineering, NIT Agartala, Barjala, Jirania, Agartala, Tripura, 799046, India
DOI: <https://doi.org/10.1007/s40033-023-00472-z>

Published Articles in IET Journals

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Publication date: 28 March 2023
Pages: 211 - 225

Title: **Tribo-Mechanical Characterisation of Borohydride Reduced Ni-B-W Coatings**
Authors: **Manik Barman, Tapan Kumar Barman & Prasanta Sahoo**
Department of Mechanical Engineering, Heritage Institute of Technology, Kolkata, India
Department of Mechanical Engineering, Jadavpur University, Kolkata, India

DOI: <https://doi.org/10.1007/s40033-023-00471-0>
Publication date: 30 March 2023
Pages: 227 - 247

Title: **Study on Adhesion of Carbon Fiber Resin Matrix Composite Skin Coating for Aircraft**

Authors: **Xiao Chun Fang & Shao Lin Fa**
Changsha Aeronautical Vocational and Technical College, Changsha, 410124, China
Lingyun Technology Group Co., Ltd, Wuhan, 430040, China

DOI: <https://doi.org/10.1007/s40033-023-00474-x>
Publication date: 31 March 2023
Pages: 249 - 254

Title: **A Laboratory Study on Application of Synthesised Amylopectin-grafted-Polyacrylamide (AP-g-PAM) on Coal Mine Haul Road Dust Emission at Different Atmospheric Temperatures**

Authors: **Vivek Kumar Kashi, N C Karmakar, S Krishnamoorthi, Pubali Adhikary & Atma Ram Sahu**
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Rajamahendravaram, 533296, India

DOI: <https://doi.org/10.1007/s40033-023-00473-y>
Publication date: 06 April 2023
Pages: 255 - 262

Title: **Effect of Varying Volume Fraction of Reinforcement on the Microstructure, Hardness and Tribological Behaviour of Aluminium Metal Matrix Composites Developed Through FSP Technique**

Authors: **Abdul Jabbar Ansari & Mohd Anas**
Department of Mechanical Engineering, Integral University, Lucknow, U.P., 226026, India

DOI: <https://doi.org/10.1007/s40033-023-00476-9>
Publication date: 08 April 2023
Pages: 263 - 273

Title: **Finite Element Modelling and Experimental Investigation of Tensile, Flexural, and Impact Behaviour of 3D-Printed Polyamide**

Authors: **Pradeep Kumar Mishra, Bandi Karthik & T Jagadesh**
Department of Production Engineering, National Institute of Technology, Tiruchirappalli, India

DOI: <https://doi.org/10.1007/s40033-023-00477-8>
Publication date: 09 April 2023
Pages: 275 - 283

Title: **Effect of Two-Step Ball Milling on Microstructure and Mechanical Properties of**

- AI4032/Bimodal-B4C Composites**
Authors: **G Arumugam, S Saravanan, S Mohamed Iqbal & P Kishorekumar**
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Department of Mechanical Engineering, Veltech Rangarajan Dr Sagunthala R&D Institute of Science and Technology, Chennai, Tamilnadu, 600062, India
Department of Mechanical Engineering, SRK Institute of Technology, Vijayawada, Andhrapradesh, 521108, India
DOI: <https://doi.org/10.1007/s40033-023-00479-6>
Publication date: 09 April 2023
Pages: 285 - 295
- Evaluation of Surface Delamination in Drilled Fiber-Reinforced Polymer Composites Using Digital Image Processing**
Authors: **N Mohan, C Hemanth Kumar, T S Sachit & Arunkumar Bongale**
Acharya Institute of Technology, Bangalore, India
Symbiosis International (Deemed University), Pune, India
DOI: <https://doi.org/10.1007/s40033-023-00464-z>
Publication date: 11 April 2023
Pages: 297 - 304
- Ageing Kinetics of Al-4.28Cu-1.60 Mg Alloy Micro-Alloyed with Titanium**
Authors: **Manash Bhuyan & Anil Borah**
Department of Mechanical Engineering, Assam Engineering College, Guwahati, Assam, India
DOI: <https://doi.org/10.1007/s40033-023-00481-y>
Publication date: 12 April 2023
Pages: 305 - 311
- Experimental and Computational Analysis of Thermal Characteristics of Polymer Resin Reinforced with Rice Husk and Aluminium Nitride Filler Composites**
Authors: **J Balaji, M M Nataraja, K Sadashiva & S Supreeth**
Department of Mechanical Engineering, Dr. Ambedkar Institute of Technology, Bangalore, 560056, India
DOI: <https://doi.org/10.1007/s40033-023-00480-z>
Publication date: 13 April 2023
Pages: 313 - 321
- Development of Artificial Neural Network Model for Indian Steel Consumption Forecast**
Authors: **Vishant Kumar & Ramesh Kumar**
Mechanical Engineering Department, Deenbandhu Chhotu Ram University of Science and Technology, Murthal, Sonapat, Haryana, 131039, India
DOI: <https://doi.org/10.1007/s40033-023-00482-x>
Publication date: 13 April 2023
Pages: 323 - 331
- Finite Element Implementation of ANN-Based Constitutive Models for DSA in SS304**
Authors: **Siddhartha Patra, Sankar Dhar & Sanjib Kumar Acharyya**
Department of Mechanical Engineering, Jadavpur University, Kolkata, 700032, India
DOI: <https://doi.org/10.1007/s40033-023-00475-w>

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Publication date: 18 April 2023
Pages: 333 - 349

Title: **A Study of Mechanical Properties on Aluminum-Based Hybrid metal Matrix Composite (AA7175/B4C/SiC/Gr)**

Authors: **Neeraj Kumar, Dinesh Khanduja & Ravi Pratap Singh**
Department of Mechanical Engineering, NIT Kurukshetra, Haryana, 136119, India
DOI: <https://doi.org/10.1007/s40033-023-00485-8>

Publication date: 18 April 2023
Pages: 351 - 358

Title: **Development of a Reliable Wireless Communication System to Monitor Environmental Parameters from Various Positions of Underground Mines to the Surface using ZigBee Modules**

Authors: **Sandi Kumar Reddy, Anil S. Naik & Govinda Raj Mandela**
Department of Mining Engineering, National Institute of Technology Karnataka, Surathakal, Mangalore, 575025, India

DOI: <https://doi.org/10.1007/s40033-023-00486-7>

Publication date: 18 April 2023
Pages: 359 - 383

Title: **Microstructural Characteristics and Wear Behavior of Sintered Ni-Modified Ti-xTiB₂ Composites**

Authors: **Oluwasegun Eso Falodun, Samuel Ranti Oke, Peter Apata Olubambi, Joseph Osekhoghene Dirisu & Rasidi Sule**
Department of Mechanical Engineering, Covenant University, Ota, Ogun State, Nigeria
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DOI: <https://doi.org/10.1007/s40033-023-00484-9>

Publication date: 19 April 2023
Pages: 385 - 394

Title: **Employing Aluminum Matrix Composite for Stir Casting Process for Investigating the Performance of A1-6061**

Authors: **A Anu Kuttan, R Rajesh & M Dev Anand**
Department of Aeronautical Engineering, Noorul Islam Centre for Higher Education, Kumaracoil, Thuckalay, Kanniyakumari, Tamil Nadu, 629 180, India
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DOI: <https://doi.org/10.1007/s40033-023-00469-8>

Publication date: 25 April 2023
Pages: 395 - 403

Title: **Study and Fabrication of Fan Blade Using Coconut Leaf Sheath Fibre/Epoxy-Reinforced Composite Materials**

Authors: **A Karthik, R Jeyakumar, P S Sampath, R Soundararajan & G K Manikandan**
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India

DOI: <https://doi.org/10.1007/s40033-023-00478-7>

Publication date: 13 May 2023

Pages: 405 - 412

Title: **Studies on the Rheological Characteristics of Flocculated Calcitic Ore Slurry**

Authors: **Md Serajuddin, Anand Rao Kacham & Sulekha Mukhopadhyay**

Mineral Processing Division, Materials Group, Bhabha Atomic Research Centre, AMD Complex,
Begumpet, Hyderabad, 500016, India

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Mumbai, Maharashtra, 400085, India

DOI: <https://doi.org/10.1007/s40033-023-00489-4>

Publication date: 15 May 2023

Pages: 413 - 424

Title: **Analysis of Thermal Behaviour of Carbon Nanotubes-Reinforced HDPE Composites Developed
Using FDM Process**

Authors: **J Deepak, H Adarsha, R Keshavamurthy & N P Ramkumar**

Department of Mechanical Engineering, Faculty of Engineering and Technology, Jain Global
Campus, Bengaluru, 562 112, India

Department of Mechanical Engineering, Dayananda Sagar College of Engineering, Bangalore, India

DOI: <https://doi.org/10.1007/s40033-023-00493-8>

Publication date: 15 May 2023

Pages: 425 - 437

Title: **Reduction Behaviour of Electric Arc Furnace Dust (EAFD)-Coal Composite Pellet in a Muffle
Furnace**

Authors: **Banty Kumar & Gour Gopal Roy**

Department of Metallurgical & Materials Engineering, Indian Institute of Technology, Kharagpur,
721302, WB, India

DOI: <https://doi.org/10.1007/s40033-023-00488-5>

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Title: **Tribological and Corrosion Behavior of Eggshell and Agro-waste RHA Reinforced Al Alloy
Composite Material with and without Ball-Milling**

Authors: **Shashi Prakash Dwivedi, Vijay Kumar Dwivedi & Rajat Yadav**

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DOI: <https://doi.org/10.1007/s40033-023-00492-9>

Publication date: 20 May 2023

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Pages: 449 - 460

Title: **Modelling of Dry Sliding Wear Performance of Al-WC Nanocomposites**

Authors: **Ranjit Kumar Das, Suswagata Poria & Prasanta Sahoo**

Department of Mechanical Engineering, Swami Vivekananda Institute of Science and Technology, Kolkata, India

Department of Mechanical Engineering, Jadavpur University, Kolkata, India

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Publication date: 20 May 2023

Pages: 461 - 475

Title: **Process Mineralogy for the Development of a Flowsheet to Recover Monazite From Offshore Placer Deposit**

Authors: **Deependra Singh, B. R. Mishra, Suddhasatwa Basu & Raghupatruni Bhima Rao**

IREL (India) Limited, Mumbai, India

CSIR – Institute of Minerals and Materials Technology, Bhubaneswar, 751013, India

Academy of Scientific and Innovative Research, (AcSIR), Ghaziabad, 201002, India

DOI: <https://doi.org/10.1007/s40033-023-00487-6>

Publication date: 21 May 2023

Pages: 477 - 487

Title: **Development of a Sustainable Development Framework for Mining Regions: A Case Study Approach**

Authors: **Sanniv Dipankar Shome, Surajit Chakraborty & Suranjan Sinha**

Indian Institute of Technology Kharagpur, Kharagpur, West Bengal, India

DOI: <https://doi.org/10.1007/s40033-023-00491-w>

Publication date: 22 May 2023

Page: 489 - 502

Title: **Improving the Mechanical and Corrosion Behaviour of Friction Surfaced Aluminium Deposition by Forced Convection Nitrogen Shielding Technique**

Authors: **Dillip Kumar Sahoo, Siddhartha Babu Chaudhary, Nassion Neupane & Bachina Harish Babu**

School of Mechanical Engineering, Sathyabama Institute of Science and Technology, Chennai, Tamil Nadu, 600119, India

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DOI: <https://doi.org/10.1007/s40033-023-00496-5>

Publication date: 30 May 2023

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Title: **Tribological Studies of Nanoclay-Reinforced PLA Composites Developed by 3D Printing Technology**

Authors: **Satyabodh Raichur, R Ravishankar & R Ravi Kumar**

APS College of Engineering, Bangalore, India

SJCE, Mysore, India

DOI: <https://doi.org/10.1007/s40033-023-00500-y>

Publication date: 03 June 2023

Pages: 517 - 525

Title: **Recent Progress in CNT-Reinforced Composite and FGM for Multi-functional Space**

Applications and Future Directions
Authors: **Lokesh Sarkar, Saptarshi Saha, Rahul Samanta, Arijit Sinha, Gurudas Mandal, Arindam Biswas & Apurba Das**

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Pages: 527 - 541

Iron Ore Characterization Techniques in Mineral Processing

Authors: **Mohan Poojari, Harsha Vardhan & Harshitha Madhusoodan Jathanna**

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Pages: 543 - 551

Quantum Dots as Efficient Solar Energy Absorber: Review on Photovoltaics and Photoelectrochemical Systems

Authors: **Sonal Sahai, Ashu Jangra, Lisy M Thomas & Vibha R Satsangi**

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DOI: <https://doi.org/10.1007/s40033-023-00490-x>

Publication date: 16 May 2023

Pages: 553 - 566

Impact of Surface Miner Utilisation on Production Efficiency in Opencast Coal Mines Using Least Squares Method: A Case Study

Authors: **Nilesh Pratap Singh, Vikram Seervi, Nawal Kishore & Amit Kumar Verma**

Department of Mining Engineering, Indian Institute of Technology (BHU), Varanasi, 221005, India

DOI: <https://doi.org/10.1007/s40033-023-00451-4>

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Pages: 567 - 580

An Investigation into the Effect of Rain on Fragmented Coal: A Case Study

Authors: **Ali Amaan Md Ajaj Ansari, Vikram Seervi, Nawal Kishore & Nilesh Pratap Singh**

Department of Mining Engineering, Indian Institute of Technology-BHU, Varanasi, 221005, India

DOI: <https://doi.org/10.1007/s40033-023-00454-1>

Publication date: 07 February 2023

Pages: 581 - 594

Correction to: Stochastic Study of Random-Ballistic Competitive Growth Model in 2 + 1

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Dimension and Related Scaling Exponents
Authors: **S K Das, D Banerjee & J N Roy**
Department of Physics, Durgapur Government College, Durgapur, India
Department of Physics, Kazi Nazrul University, Asansol, West Bengal, 713340, India
Faculty of Engineering and Computing Sciences, Teerthanker Mahaveer University, Moradabad, Uttar Pradesh, 244001, India
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Sl. No.	Name of the Course	Scheduled Dates
1.	Advances in Design & Optimization of UAV's for Industrial Applications (Defence, Mining & Construction)	06-09 May 24
2.	Geometric dimensioning and tolerancing	06-08 May 24
3.	Conducting EIA Study and Preparation of EIA reports – Case study & Group Discussion	07 - 09 May 24
4.	Occupational Health and Safety (OH&S) Management System	07 - 10 May 24
5.	Electrical Safety Procedures & Accident Prevention	07 - 10 May 24
6.	Trends in Mechanization & Technology in Underground and Opencast Mining for Improved Productivity and Safety	8 - 10 May 24
7.	Concepts on Design, Construction & Maintenance of Culverts	13 - 17 May 24
8.	Applications of Python for Mechanical Systems	13-15 May 24
9.	Smart Irrigation Technology for Better Water Use Efficiency	13 - 15 May 24
10.	Big Data Analytics Using MS Excel & Power BI	14 - 17 May 24
11.	Power Plant Chemistry for Chemists and Operation Engineers	14 - 16 May 24
12.	Nature based Solutions for Sustainable Development	15 - 17 May 24
13.	Executive Development Programme in Digital Transformation Strategies: For Future Ready Organisations.	15 - 17 May 24
14.	Sustainable Practices in Mining: Environmental Laws & Policies, Land Acquisition, Social Impact Assessment, Rehabilitation & Resettlement, District Mineral Foundation, Application of Geographic Information System and Remote Sensing for Monitoring	15 - 17 May 24
15.	Sustainable Storm Water Drainage System	20 - 22 May 24
16.	Effective Utilization of Organizational Resources in Opencast Mining Projects: Total Productive Maintenance of Machinery, OITDS, Machine Utilization, Standard Operating Procedures, Design of Haul Roads, Tyre-Care, Conservation of Fuels & Energy, Mine Wastes to Resources ISO-50001:2018	22 - 24 May 24
17.	Good Laboratory Practices	22 - 24 May 24
18.	Network & Security Administration	27 - 31 May 24
19.	Vibrations, Balancing, Alignment and Condition Monitoring of Rotating Equipment (Theory and Practical Orientation with Technical Visit)	27 - 31 May 24
20.	Flood Analysis Using Advanced Software Techniques	27 - 31 May 24
21.	Integrated Scientific Project Management	28 - 30 May 24
22.	Rooftop Solar PV Grid - Design, Erection, Commissioning & Maintenance	28 - 31 May 24