# IEI Epitome

Volume 8 | Issue 7 | July 2023

A Century of Service to the Nation

## IN THIS ISSUE ...



## announcements ...




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Design & Outlay

Ms H Roy





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# Notification for IEI 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 IEI. 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 in 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:

**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.

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**Er Sharad Mohandas Shanbhag,** AMIE
Assistant Professor
Don Bosco College of Engineering, Fatorda, Goa
✉ sms2ssm@yahoo.co.in

**Er Sharad Mohandas Shanbhag** was being recognised as **NPTEL Motivated Learner** & **NPTEL Discipline Star** in Mechanical Engineering during July-Dececember 2022.

# IEI AWARDS

## Call for Papers

The **Steel Authority of India Ltd** (**SAIL**) had instituted two Awards, namely, **SAIL AWARD** and **DR M VISVESVARAYA AWARD** to be given away every year during the **Indian Engineering Congress** to author/s of the articles adjudged best on selected topics. The prize-winning papers will be published in the **Technical Volume of 38th Indian Engineering Congress**.

The topics for the year 2023 are given hereunder.

**SAIL AWARD**

**Beneficiation of Iron Ore — Existing Best Practices / Technologies and Way Ahead**

**DR M VISVESVARAYA AWARD**

**Improvement in Productivity of Blast Furnaces — Way Forward**

Intending contributors are requested to send the soft copy of the paper by email to award@ieindia.org (with subject heading Paper for **SAIL / Dr M Visvesvaraya Award**) and submit four nos. printed copies of their articles to:

**Director (Technical)**
The Institution of Engineers (India),
8 Gokhale Road, Kolkata 700020

Last date of submission: **15 September 2023**

For downloading the template of paper and declaration form, please visit the following link:
https://www.ieindia.org/webui/IEI-Activities.aspx#Call_Papers

## Book

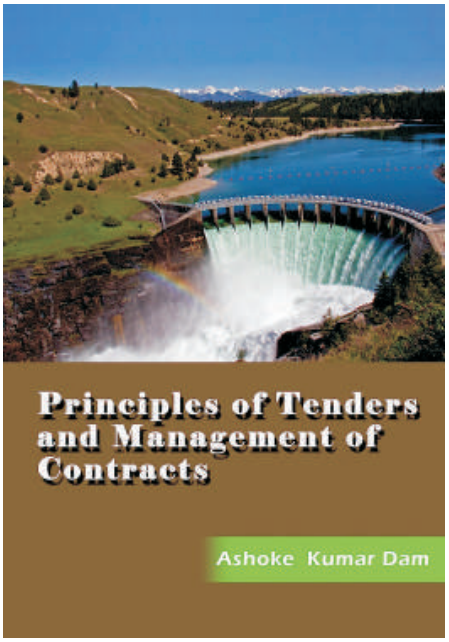
**Er Ashoke Kumar Dam,** FIE
Former Executive Director
North Eastern Electric Power Corporation (A Government of India Enterprise)
✉ dam.ashoke12@gmail.com

### Principles of Tenders and Management of Contracts

**What is in the Book**

This book deals in depth and in a comprehensive manner all matters from invitation of tender till completion of a work. Starting from meaning of terms, eligibility of bidders, invitation and processing of tenders, award and execution of work, every step is explained. How to ensure quality of work, materials or equipments has been described. The problems during execution and their possible solution are discussed. For expediting execution, how to monitor progress has been explained.

Land acquisition, environmental and forest clearance in forest areas including implementation of stipulations of MOEFCC have been discussed. Measures to protect environment and ecosystem in small construction, where it is not mandatory, are proposed.




**Details**:

ISBN: 978-93-5788-023-7
Date of Publication: 1 January 2023
Publisher: Asian Press Book, Kolkata

# IEI Industry Excellence Award 2023

## Request for Participation

The IEI Industry Excellence Award has been instituted to recognize industry leaders for their innovation, excellence in engineering operations and thereby, to lead their industry in competitive manner. The benchmarks created by the industries in India have included productivity, quality, safety and performance assurance thereby giving India the rightful place in the global markets. Realizing that such industries can provide the leadership to a large number of other industries in the country, it has been considered appropriate by the IEI Council to institute the IEI Industry Excellence Awards in the year 2008.

Applications in specified format (visit link: *https://www.ieindia.org/webui/IEI-Activities.aspx#industry-excellence-award*) are invited from prospective applicants for **IEI Industry Excellence Award 2023**. The last date of receipt of application for the Award 2023 is **30 September 2023**.

Interested applicants are requested to send their applications (Two hard copies & One soft copy in Pendrive/CD) to the below mentioned address.

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

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**Er Animesh Kumar Saha,** FIE
Dy Chief Engineer (Retired)
NCSM (Science City), Ministry of Culture, Government of India
✉ animesh_saha12@rediffmail.com; animeshksaha.1958@gmail.com

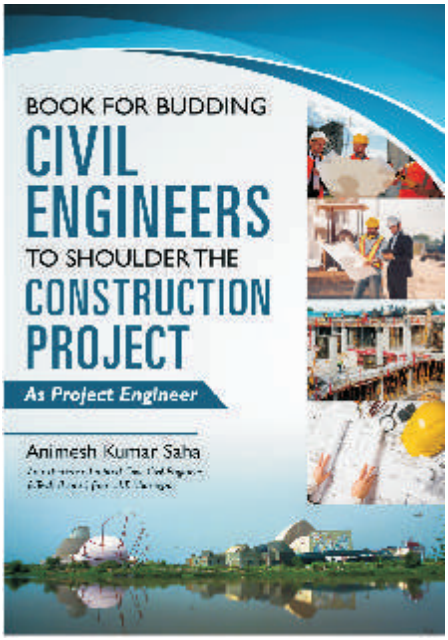
## Book for Budding Civil Engineers to Shoulder the Construction Project as Project Engineer

### About the Book

This book is comprising of all the Civil Engineering subjects briefly in the form of Questions and Answers starting from the Project Planning to the Finishing Items with relevant sketches to understand the answers easily. Probably, it is the first time this kind of book has been published and brought amongst the Engineering students. This book will help the students to grasp the jobs as well to shoulder the responsibility of construction site as Site Engineer or Project Engineer.

**Details**:

| | |
|---|---|
| ISBN-13: | 978-1636409139 |
| ISBN-10: | 163640913X |
| Date of Publication: | 01 June 2023 |
| Publisher: | White Falcon Publishing, Chandigarh |




# IEI Industry Excellence Award for Start Up Initiatives

## Request for Participation

The engineering sector is experiencing remarkable growth with Government and private funding, presenting immense commercial potential on a global scale. Technology and innovation are the driving forces behind a vibrant MSME ecosystem, with start-ups acting as a perennial source of inspiration.

We cordially invite **start-up organizations** in Engineering, Consultancy Services, Construction, Healthcare, Utility Services, IT & Telecommunication, and related domains to apply for the prestigious IEI Industry Excellence Award 2023. To be eligible, applicant organizations must be duly registered with DPIIT, IN-SPACe, ISRO, Ministry of MSMEs, Government of India, and relevant State Industrial Development Corporations.

The IEI Industry Excellence Award 2023 aims to recognize and celebrate innovative start-ups that demonstrate exceptional promise and positive impact on society. By participating in this prestigious award, you not only stand a chance to gain industry recognition but also open doors to new opportunities, partnerships, and potential investors.

To participate, submit your applications using the specified format available at *https://www.ieindia.org/webui/IEI-Activities.aspx#industryexcellence-award*. The application deadline is **30th September 2023**.

Send two hard copies and one soft copy (Pen drive/CD) to:

**The Director [Technical]**
The Institution of Engineers (India), 8 Gokhale Road, Kolkata 700 020

We eagerly await your participation in this celebration of ingenuity and entrepreneurship.

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## Papers published in the Journals / Proceedings ....

**Dr Kudiyarasan Swamynathan,** FIE & Certified Professional Engineers, IEI
Scientific Officer E
Bhavini, DAE, Kalpakkam, Kancheepuram, Tamil Nadu
✉ kudiyarasan@rediffmail.com, skarasan_bhavini@igcar.gov.in

**Title of Paper: Design of High-Speed Data Transfer Turbo Code for Body Channel Communication Transceivers**

International Journal of Communication Systems,John Wiley & Sons Ltd, 2023, 36(7), 2023, Online ISSN:1099-1131, Print ISSN: 1074-5351

**DOI:** https://doi.org/10.1002/dac.5447

**Co-authors:** Sankaran Vijayalakshmi, Alagumariappan Paramasivam, Sankaran Sakthivel, Esakky Sankaran & Velmurugan Nagarajan

***Abstract:*** *In this work, a digital differential transmitter based on low-power wireless compensation transceiver for body channel communication (BCC) is proposed. Further, the proposed transceiver is composed of Touch Status Detection Unit (TSDU), Wireless Status Compensation Unit (WSCU), and a reconfigurable preamplifier. Initially, the human body channel environment for wireless communication is investigated based on properties from 1 to 100 MHz. Further, the turbo code-based encoding scheme is used to encode the data before transferring the data on the transmitter side. Also, the proposed error-correcting parallel turbo decoder using a modified step-by-step algorithm is presented. The turbo code-based decoding scheme is used to recover the error-free transmitted data at the receiver side. Results demonstrate that the proposed BCC transceiver is designed using 90 nm CMOS technology and it is observed that the proposed BCC transceiver has utilized an area of 600 $mm^2$. Also, the maximum data rate achieved by a proposed BCC transceiver was 100 Mbps, and the overall transceiver power consumption is 0.42 mW, and energy for communication is 0.02 nj/b.*

***Keywords:*** *Body Channel Communication; Encoding Scheme; Error Correction; Modulation; Transceivers*

## IEI Industry Excellence Award for Overseas Organizations

### Request for Participation

**Discover IEI:**

Welcome to The Institution of Engineers (India) or IEI – your gateway to engineering excellence and worldwide collaborations. With strong ties to esteemed international bodies, IEI stands as a beacon of innovation on the global stage. For more details, visit www.ieindia.org.

**Introducing the IEI Industry Excellence Award:**

To recognize industries' crucial role in shaping society and the economy, IEI instituted these awards in 2008. They honor remarkable innovation, excellence in engineering operations, and unwavering commitment to high standards.

**Join Us in Celebrating Excellence:**

We take immense pride in the global industrial achievements – productivity, quality, safety, and performance assurance that have earned industries a significant place worldwide. At IEI, we firmly believe that industry leaders like you hold the key to shaping a brighter future on a global scale.

**Why Participate?**

- Elevate Your Status: Gain national and international acclaim for your exceptional achievements.
- Lead the Charge: Set new excellence standards and inspire industries worldwide.
- Unlock Opportunities: Forge invaluable connections with like-minded global leaders.
- Champion the Profession: Participate and uphold engineering's prestige and integrity.

**How to Participate:** Visit *https://www.ieindia.org/webui/IEI-Activities.aspx#industry-excellence-award* and apply easily. Be part of a global celebration of engineering brilliance!

**Join the Prestigious Ranks:** Don't miss the chance to shine on the world stage. Unleash your organization's potential and celebrate engineering excellence with us.

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**Er Rao Y Mannepalli,** FIE
Chief Scientist
Leidos, USA
✉ raoym@ieee.org

**Title of Paper: Digital Engineering is too Important to be Left alone to MBSE Practitioners**

American Institute of Aeronautics and Astronautics (AIAA), AIAA AVIATION 2023 Forum, 12-16 June 2023, San Diego, USA

**DOI:** https://doi.org/10.2514/6.2023-3772

***Abstract:*** *Weapon systems critical to national security are increasingly becoming more complex and expensive. The cost overruns alone are estimated to be about half-a-trillion Dollars making it the second largest defense budget in the world. To address this problem DOD introduced the Digital Engineering initiative in 2018. Even though its vision and scope are laudable, not all the areas/disciplines involved in realizing the weapon systems are excited. There is a certain poverty of imagination in naming the vision as "Digital Engineering." Most people misunderstood it to be an engineering initiative (in particular systems engineering). This paper redefines the term "Engineering" in Digital Engineering as a process (e.g., engineering a political coup rather than like Mechanical/Electrical/Systems Engineering), which then addresses all the five pillars of Digital Engineering. Another disturbing trend noticed by the author is that the Systems Engineering community equated Model Based Systems Engineering (MBSE) to Digital Engineering. This prevents new thinking and thereby limits or negates the vision of Digital Engineering. This paper also touches upon the origins of systems engineering at Bell Labs, obsession with the term "Model" to mean anything and everything, including a text document or a static picture, and digital twins. It gives practical and useful definitions of "Model" and "Digital Twin" and provides examples and some best practices followed in developing them. It also lists some of the disruptive technologies like ChatGPT which potentially could eliminate even the need to write computer programs. These systems can fuse Unstructured, Uncertain, Incomplete, Imprecise, and even Contradictory (UUIIC) information from all sources. This will make the current processes obsolete, including the systems engineering . Finally it presents the lessons learned and some recommendations for the near term including how to prevent the Digital Twins from becoming "Evil Twins".*

***Keywords:*** *Digital Engineering; MBSE; Digital Twin; Silver Bullet; Systems Engineering*

# IEI Engineering Education Excellence Award 2023

## Request for Participation

The IEI Engineering Education Excellence Award has been instituted to recognize leading Engineering Educational Institutions and encourage for better and more effective engineering education across the country. The engineering education sector has witnessed significant development, setting benchmarks for others to follow. Universities and institutions have expanded their scope beyond pedagogy and now engage in R&D activities, consultancy, patents, publications, skill development programs, industry interface, and the implementation of the New Education Policy (NEP), contributing to India's global prominence. Recognizing that such institutions can lead and inspire numerous others in the country, the IEI Council has decided to establish the IEI Engineering Education Excellence Awards.

Prospective applicants are invited to submit their applications in the specified format (visit link: https://www.ieindia.org/webui/IEI-Activities.aspx#engineering-education-excellence-award) for the **IEI Engineering Education Excellence Award 2023**. The deadline for submitting of applications for the Award 2023 is **30 September 2023**. Interested applicants are requested to submit their applications (**Four hard copies & One soft copy in Pendrive/CD**) to the below mentioned address.

**The Director (Technical)- I/C**
The Institution of Engineers (India)
8 Gokhale Road, Kolkata 700 020

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**Dr Raj Kumar Goswami,** FIE
Principal & Professor
Department of Electronics and Communications Engineering
Gayatri Vidya Parishad College of Engineering for Women, Madhurawada,
Visakhapatnam, Andhra Pradesh
✉ rajkumargoswami@gmail.com

**Title of Paper: Performance Analysis of Different Applications of Image Inpainting based on Exemplar Technique**

International Journal on Recent and Innovation Trends in Computing and Communication, 11(4), 2023, ISSN: 2321-8169

**DOI:** https://doi.org/10.17762/ijritcc.v11i4.6393

**Co-authors:** Tammineni Shanmukha Prasanthi, Swarajya Madhuri Rayavarapu, Yenneti Laxmi Lavanya, Gottapu Santosh Kumar, Gottapu Sasibhushana Rao & Narendra Kumar Yegireddy

***Abstract:*** *In this age of rapidly developing image processing, inpainting has been a popular and practical art. Researchers have paid considerable attention to image inpainting throughout the years due to its enormous significance and effectiveness in a wide range of image processing applications, including the removal of scratches, the elimination of objects, and the modification of faces. It is one of the most challenging issues in image processing, demanding a comprehensive understanding of the image's texture and structure. The quality of inpainted image is a crucial factor which determines how close the inpainted image is to the original image. Many improvements have been implemented in the exemplar-based approach to increase the quality of inpainted regions containing structure and texture information. There are numerous ways to assess the quality of an inpainted image. In this study, the applications of exemplar based inpainting are evaluated using standard analytical measures including Sum of Absolute Difference (SAD), Peak Signal-to-Noise Ratio (PSNR), Correlation Coefficient, and Structural Similarity Index Measure (SSIM).*

***Keywords:*** *Exemplar based Inpainting; Peak Signal-to-Noise Ratio (PSNR); Correlation Coefficient; Structural Similarity Index Measure (SSIM); and Mean Square Error (MSE)*

## WFEO 2023 Awards – Call for Nominations

The WFEO Secretariat is pleased to advise you that the call for nominations is now open for:

- The 2023 WFEO - GREE Women in Engineering Award
- The 2023 WFEO Medal for Excellence in Engineering Education
- The 2023 WFEO - CCC H. J. Sabbagh Prize for Excellence in Engineering Construction

The combined presentation and nomination forms for each of the above mentioned Awards can be downloaded at http://www.wfeo.org/awards.

The awards are open for nominations by any institution, however nominations sent or supported by WFEO member organizations will be highly regarded.

For all three awards, please note that the deadline for nominating for any of those awards is **31 August 2023**.

Nominations are to be sent only at wfeo-awards@wfeo.org.

The Laureates will be announced at the forthcoming WFEO World Engineers' Convention and General Assembly meetings in Prague, 9-15 October 2023.

The WFEO Secretariat may be contacted at secretariat@wfeo.org for any queries.

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**Er A Keshav Bharadwaj,** MIE
PhD Student
Department of Computer Science, PES University, Bangaluru, Karnataka
✉ akeshavb@hotmail.com; keshavbharadwaj@pes.edu

**Title of Paper: Transforming Natural Language Requirements into Petri Nets — a Semi-Automated Approach**

Grenze International Journal of Engineering and Technology (GIJET), Grenze Scientific Society, 9(1), 2023, pp 2176-2188, Online ISSN : 2395-5295, Print ISSN : 2395-5287, Grenze ID: 01.GIJET.9.1.52_1

**URL:** http://thegrenze.com/index.php?display=page&view=journalabstract&absid=1663&id=8

**Co-authors:** Vinod K Agrawal & Jayashree R

***Abstract:*** *Software requirements are mostly specified in natural language (say English) and may contain errors. To prevent such errors, the requirements need to be transformed using formal methods, as analysis, identification and subsequent removal of errors are easier. But expression of requirements using formal methods is laborious. We propose a simple, semi-automated methodology that transforms natural language requirements into Petri nets. Petri nets allow better modeling and analysis of the requirements and hence have been chosen as the target method. A practical example of Automated Teller Machine has been used to demonstrate our approach. A tool NLTOPNGEN to implement this approach has been developed.*

***Keywords:*** *Formal Method;, Natural Language Processing; Petri Nets; Requirement Specifications; Modelling and Consistency*

**Title of Paper: Improving Software Requirements — Analysis of Petri Net Models for Inconsistency and Incompleteness**

International Journal of Engineering Trends and Technology,71(2), 2023, pp 466-492, ISSN: 2349-0918

**DOI**: https://doi.org/10.14445/22315381/IJETT-V71I2P248

**Co-authors:** Vinod K Agrawal &Jayashree R

***Abstract:*** *Stakeholders of most software projects express requirements in natural language (English is taken as the natural language here). To minimize errors in the requirements, an analysis of requirements is necessary. Direct analysis of requirements expressed in natural language is complex. Hence it is preferable that they be expressed using some formal method before they are analyzed and used for specifications development. In this paper, we have made the assumption that specification documents and Petri net models of the software requirements are available to us. We propose methods to analyze these Petri net models for inconsistency and incompleteness in the software requirements. Results obtained from the analysis are used to redefine the given user requirements such that inconsistency and incompleteness are removed. The example of an Automated Teller Machine has been used to demonstrate our approach.*

***Keywords:*** *Analysis; Completeness; Consistency; Petri nets; Requirements*

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

The form is available on IEI Website:

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

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**Er Somnath Mahato,** AMIE
Research Associate III
National Centre for Geodesy, Indian Institute of Technology Kanpur, Uttar Pradesh
✉ somnathmahato1@gmail.com

**Title of Paper: GLONASS-NavIC Hybrid Operation from India towards Seamless and Improved Performance**

National Academy Science Letters, Springer, 46(3), 2023, pp 245-250

**DOI:** https://doi.org/10.1007/s40009-023-01232-z

**Co-authors:** Shreya Sarkar, Mrinal Goswami, Surajit Kundu & Anindya Bose

***Abstract:*** *The fully operational GLObal'naya NAvigatsionnaya Sputnikovaya Sistema (GLONASS) is used in many civilian and military applications as an alternative to Global Positioning System. However, it is observed that the GLONASS constellation regularly provides inferior satellite geometry resulting in higher Position Dilution of Precision (PDOP) values from various locations across the globe and fails to provide a seamless position solution in constrained visibility conditions. In such scenarios inclusion of the regional Navigation with Indian Constellation (NavIC) signals together with GLONASS can mitigate the problems and provide uninterrupted improved position solution accuracy from India. This paper presents the possible solution to the problem by including NavIC with GLONASS within the NavIC service region. Using real-time satellite data collected from eastern India in open-sky and constrained visibility environments, it is observed that the NavIC + GLONASS hybrid operation always offers good satellite geometry with PDOP values less than 3, resulting in uninterrupted position solution in satellite visibility constrained situations even up to 20–30° elevation, and improved position solution accuracy compared to GLONASS-only operation. GLONASS provides system independence while NavIC integration extends the benefits of improved satellite geometry and enhanced solution quality. The results of this study show the benefits of global–regional systems' integrated operation for India and the surrounding regions both for defense and civilian applications.*

***Keywords:*** *GLONASS; NavIC; PDOP; Solution Quality;India*

**Er Anshu Agrawal,** AMIE
Senior Research Fellow
Department of Mechanical Engineering, SV National Institute of Technology, Surat, Gujarat
✉ anshuagrawalc54@gmail.com

**Title of Paper: Experimental Comparison of Evacuated Tube Solar Air Heater based on Energy and Exergy Analyses with Environmental and Economic (4-E) Study**

Environmental Progress and Sustainable Energy, John Wiley, 2023, Online ISSN:1944-7450

**DOI:** https://doi.org/10.1002/ep.14116

**Co-authors:** Amit Kumar & A D Parekh

***Abstract:*** *For the purpose of low-medium air heating applications like timber seasoning, HVAC,agricultural & food drying, space heating and desalination, there is requirement ofhot air. Solar air heaters are the promising systems to satisfy these requirements in avery inexpensive manner. Due to higher efficiency at higher operating temperatureand lower cost, evacuated tube collectors (ETCs) are preferred for solar air heating. Inthis manuscript, the comparative parametric study of two similar sets of evacuatedtube solar air heater (ETSAH) is performed. The comparison is based on energy & exergy analyses, and also presents the environmental and economic study (4E analyses). Each set is fabricated using mild steel (M.S.) along with 50 evacuated tubes with total collector area of 8.46 $m^2$. The experimental investigations are madeat diverse flow rates, with and without using conventional reflectors. Without incorporating any additional heat storage unit, the system provides average hot air temperatureof 76.13°C when average solar intensity was 502.68 $W/m^2$ during 11 h of operationfrom 09:00 to 20:00 h. ETC's absorber glass and the M.S. material was observed tohave significant energy storage and discharge. The single set of ETSAH has $CO_2$ mitigation of 89.20 tons with 2.05 years of energy payback period, which is significantlylow as compared to its 20 years of lifespan. For the optimum system performancethe cost of generated hot air is 0.00048 $/kg, which is considerably low.*

***Keywords:*** *Air Flow Rates; Energy; Environmental and Economic (4-E) Analyses; Evacuated Tube Collector; Exergy; Sensible Heat Storage; Solar Air Heater*

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[Agriculture, Architecture, Civil & Environment Engineering]

(Electronic ISSN: 2250-2157; Print ISSN: 2250-2149)

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

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

Volume 104, Issue 2, June 2023

Title: **A Low-Cost Portable Willow Wicker Peeling Machine: An Innovative Mechanical Intervention in the Wickercraft Industry of Kashmir**

Authors: **Masroor Ahmad Malik**, **Shahzad Faisal**, **Mohd. Muzamil**, **Bilal Ahmad Langoo**, **Rakesh Mohan Shukla**, **Monica Reshi**, **Bhagyashree Dhekale** & **Syed Zameer Hussain**

Division of Processing and Food Engineering, Sher-e-Kashmir University of Agricultural Sciences and Technology Kashmir, Srinagar, India

Division of Farm Machinery and Power Engineering, Sher-e-Kashmir University of Agricultural Sciences and Technology Kashmir, Srinagar, India

Division of Food Science and Technology, Sher-e-Kashmir University of Agricultural Sciences and Technology Kashmir, Srinagar, India

Division of Agricultural Statistics, Sher-e-Kashmir University of Agricultural Sciences and Technology Kashmir, Srinagar, India

DOI: https://doi.org/10.1007/s40030-023-00726-9

Publication date: 04 April 2023

Pages: 271–280

Title: **A New Irrigation System Without Any External Sources**

Authors: **Ramesh Chandra Nayak**, **Chandrika Samal**, **Manmatha K Roul** & **Payodhar Padhi**

Mechanical Engineering Department, Synergy Institute of Technology, Bhubaneswar, Odisha, India

Mechanical Engineering Department, GITA Autonomous College, Bhubaneswar, Odisha, India

Mechanical Engineering Department, Hi-Tech Group of Institutions, Bhubaneswar, Odisha, India

DOI: https://doi.org/10.1007/s40030-023-00730-z

Publication date: 06 April 2023

Page: 281–289

Title: **Analysis of Even and Uneven Functionally Graded Sandwich Plates with Geometric Distortions under Hygro-Thermo-Mechanical Loading**

Authors: **Venushree S Khanke** & **S N Tande**

Department of Civil Engineering, Walchand College of Engineering, Sangli, Maharashtra, India

DOI: https://doi.org/10.1007/s40030-023-00728-7

Publication date: 20 April 2023

Page: 291–300

Title: **Assessment of Spring Water Quality Using Water Quality Indices and Multivariate Statistical Techniques in Pithoragarh, Uttarakhand**

Authors: **Pankaj Kumar Thakur**, **Vinod Kumar** & **Vaibhav Deoli**

Department of Irrigation and Drainage Engineering, GB Pant University of Agriculture and Technology, Pantnagar, 263145, India
Department of Soil and Water Conservation Engineering, GB Pant University of Agriculture and Technology, Pantnagar, 263145, India
DOI: https://doi.org/10.1007/s40030-023-00709-w
Publication date: 26 January 2023
Pages: 301–316

Title: **Automation in Monitoring of Construction Projects Through BIM-IoT-Blockchain Model**
Authors: **Debasis Sarkar**, **Dhaval Dhaneshwar** & **Purvesh Raval**
Department of Civil Engineering, School of Technology, Pandit Deendayal Energy University Gandhinagar, Gandhinagar, Gujarat, 382007, India
Infrastructure Engineering and Management, Department of Civil Engineering, School of Technology, Pandit Deendayal Energy University Gandhinagar, Gandhinagar, Gujarat, 382007, India
DOI: https://doi.org/10.1007/s40030-023-00727-8
Publication date: 05 April 2023
Pages: 317–333

Title: **Comparative Analysis of Five Kinetic Models for Prediction of Methane Yield**
Authors: **S Roberts**, **N Mathaka**, **M A Zeleke** & **K N Nwaigwe**
Department of Mechanical Engineering, University of Botswana, Gaborone, Botswana
DOI: https://doi.org/10.1007/s40030-023-00715-y
Publication date: 08 March 2023
Pages: 335–342

Title: **Development of a Machine for Gathering and Packing Poultry Litter**
Authors: **M A Al-Rajhi** & **Y K Osman**
Agric. Eng. Research Institute (AENRI), Mech. of Livestock and Fish Production Dept., Agric. Research Center, Giza, Egypt
Agric. Mach. and Power Eng. Dept., Fac. of Ag. Eng., Al-Azhar U., Cairo, Egypt
DOI: https://doi.org/10.1007/s40030-023-00714-z
Publication date: 23 February 2023
Pages: 343–353

Title: **Development of an Innovative Universal Walnut Cracking and Separating Machine for Farmers and Walnut Industry of Kashmir Valley**
Authors: **Zarka Rashid**, **Shahzad Faisal**, **Mohd. Muzamil**, **Jagvir Dixit**, **Rakesh Mohan Shukla** & **Imran Khan**
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Pages: 355–365

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Title: **Examining the Lane-Wise Time Headway and Speed Characteristics at Curb-Side Bus Stop on Four-Lane Divided Urban Arterials**

Authors: **Sruthi Sekhar Pallela** & **Arpan Mehar**
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DOI: https://doi.org/10.1007/s40030-023-00720-1
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Pages: 367–380

Title: **Flood Replication Using ANN Model Concerning with Various Catchment Characteristics: Narmada River Basin**

Authors: **Sandeep Samantaray**, **Ankita Agnihotri** & **Abinash Sahoo**
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Publication date: 28 March 2023
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Title: **Identifying and Analysing the Root Causes of Quality Non-Conformance in Construction Project Baseline Schedules**

Authors: **Purushothaman Srinath** & **Koshy Varghese**
Department of Civil Engineering, Indian Institute of Technology Madras, Chennai, India

DOI: https://doi.org/10.1007/s40030-023-00713-0
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Pages: 397–416

Title: **Integrating Commodity-Based and Trip-Based Approaches of Freight Demand Modelling Using Trip Length Distributions**

Authors: **Aitichya Chandra**, **Agnivesh Pani**, **Prasanta K. Sahu** & **Sushant Sharma**
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DOI: https://doi.org/10.1007/s40030-023-00712-1
Publication date: 17 February 2023
Pages: 417–434

Title: **Traffic Crash Severity: Comparing the Predictive Performance of Popular Statistical and Machine Learning Models Using the Glasgow Coma Scale**

Authors: **Mehraab Nazir**, **Ubaid Illahi**, **Jitendra Gurjar** & **Mohammad Shafi Mir**
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DOI: https://doi.org/10.1007/s40030-023-00710-3
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Pages: 435–446

Title: **Vehicular Emission Inventory and Correlation Study for Indian Medium-Sized City**

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Title: **Vulnerability Analysis of Critical Points in Three-Hinged Arch and Tie Connection**

Authors: **Nirmal Rakeshbhai Ravaliya**, **Lovepreet Singh** & **M Abdul Akbar**
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Pages: 455–465

Title: **Effect of Partial Opening on Responses of Plan Asymmetric Multistoried Building with Soil–Structure Interaction: A Case Study**

Authors: **Debi Prasad Das**, **Diptesh Das**, **Pijush Topdar**, **Robin Kumar Biswas** & **Bibhuti Bhusan Ghosh**
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Pages: 467–472

Title: **Safety Evaluation of an Industrial Derrick Supported Chimney**

Authors: **Șerban Vasilescu**, **Costin Ilincă** & **Maria Tănase**
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Publication date: 19 March 2023
Pages: 473–482

Title: **Vulnerability Assessment of Groundwater-Based Public Drinking Water Supply System of Kamrup District, Assam, India Considering Social Parameters**

Authors: **Jayanta Goswami** & **Rajib Kumar Bhattacharjya**
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Pages: 483–499

Title: **A Critical Review on Glass Fiber-Reinforced Polymer Bars as Reinforcement in Flexural Members**

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Title: **Effect of Longitudinal Stiffeners on Flexural Behavior of Box Beams: A State-of-the-Art Review**

Authors: **Ishu Sharma** & **Gyani Jail Singh**
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Title: **A System Theoretic-Based Optimum Controller for Single-Tank System and Its Performance Comparison with PID Controller**
Authors: **Prasad Choudhari**, **N. R. Kulkarni** & **Mayuresh Bakshi**
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Engineering and Applied Science Department, Vishwakarma Institute of Information Technology, Pune, India
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Title: **An Approach for Steering Wheel Angle Evaluation Without Using a True Power-on Steering Angle Sensor in Electric Power Steering Systems**
Authors: **Deivaraja Ramasamy**
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Authors: **Jyostna Devi Bodapati**, **RamaKrishna Sajja** & **Veeranjaneyulu Naralasetti**
Department of Advanced Computer Science and Engineering, Vignan's Foundation for Science Technology and Research, Vadlamudi, India
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Title: **Assessment, Categorisation and Prediction of the Landslide-Affected Regions Using Soft Computing and Clustering Techniques**
Authors: **Md. Iqbal Quraishi** & **J. Paul Choudhury**
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India
DOI: https://doi.org/10.1007/s40031-023-00876-1
Publication date: 16 April 2023
Pages: 579–602

Title: **Automated Freshwater Fish Species Classification using Deep CNN**

Authors: **Jayashree Deka**, **Shakuntala Laskar** & **Bikramaditya Baklial**
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Title: **Classification and Authentication of Induction Motor Faults using Time and Frequency Feature Dependent Probabilistic Neural Network Model**

Authors: **Arunava Kabiraj Thakur**, **Alok Mukherjee**, **Palash Kumar Kundu** & **Arabinda Das**
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Title: **Comparative Assessment of BSS Techniques for Non-Invasive Extraction of Fetal ECG from Abdominal ECG Signal**

Authors: **Prabhjot Kaur** & **Lillie Dewan**
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Title: **Decentralized and Secure Blockchain-Powered Smart Card-Based Cloud Voting System**

Authors: **Roneeta Purkayastha** & **Abhishek Roy**
Department of Computer Science and Engineering, Adamas University, Kolkata, India

DOI: https://doi.org/10.1007/s40031-023-00881-4
Publication date: 13 April 2023
Pages: 651–658

Title: **Early-Stage Detection and Classification of Breast Neoplasm Stages Using OGRU-LSTM-BiRNN and Multivariate Data Analysis**

Authors: **V S Renjith** & **P Subha Hency Jose**
Department of Biomedical Engineering, Karunya Institute of Technology and Sciences, Coimbatore, India

DOI: https://doi.org/10.1007/s40031-023-00882-3
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Title: **Economic and Environmental Impact of Energy Efficient Design of Smart Lighting System**
Authors: **Arshad Mohammad**, **Modabbir**, **Imtiaz Ashraf** & **Md Mustafa Kamal**
Department of Electrical Engineering, Aligarh Muslim University, Aligarh, India
DOI: https://doi.org/10.1007/s40031-023-00885-0
Publication date: 05 May 2023
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Title: **Efficient Link Prediction with Clusterized Batch Training in Graph Convolution Network**
Authors: **Ekesh Khadka** & **Nanda Bikram Adhikari**
Department of Electronics and Computer Engineering, Institute of Engineering, Pulchowk Campus, Tribhuvan University, Pulchowk, Lalitpur, Bagmati, 44700, Nepal
DOI: https://doi.org/10.1007/s40031-023-00877-0
Publication date: 20 April 2023
Pages: 693–701

Title: **Energy Efficiency Enhancement in LTE-A Network Using SP-ZF with Channel Estimation and Power Allocation Algorithm**
Authors: **Surender Ragunathan** & **Dananjayan Perumal**
Department of Electronics and Communication, SRM Institute of Science and Technology, Ramapuram Campus, Chennai, India
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DOI: https://doi.org/10.1007/s40031-023-00873-4
Publication date: 05 April 2023
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Title: **Experimental Investigation of Modern Control Algorithms for Power Quality Improvement for Single-Phase Grid-Connected Photo-Voltaic System**
Authors: **Prakash Chittora**, **Alka Singh**, **Madhusudan Singh** & **Hemant Saxena**
Electrical Engineering Department, Delhi Technological University, Delhi, 110042, India
DOI: https://doi.org/10.1007/s40031-023-00887-y
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Title: **Multi-objective Particle Swarm Optimization-Based Placement and Sizing of Distributed Generators Integrated to Unbalanced Low-Voltage Microgrids by Four-Leg Inverters**
Authors: **Gitu Das** & **Durlav Hazarika**
Department of Electrical Engineering, Assam Engineering College, Guwahati, Assam, 781013, India
DOI: https://doi.org/10.1007/s40031-023-00890-3
Publication date: 10 May 2023
Pages: 731–747

Title: **Next-Generation MS-to-RWG Interconnects for Microwave and mm-Wave Communications Using Microstrip Antenna as RF Energy Launcher @ 140 GHz**
Authors: **Atul Varshney**, **Vipul Sharma** & **Arun Agarwal**
ECE Department, FET Gurukula Kangri (Deemed to be University), Haridwar, Uttarakhand, 249404, India
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DOI: https://doi.org/10.1007/s40031-023-00889-w

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Title: **Performance Evaluation of Microstrip Patch Antenna with Circular Slots**
Authors: **Upasana Tripathi**
J C Bose University of Science and Technology, Haryana, 121006, India
DOI: https://doi.org/10.1007/s40031-023-00879-y
Publication date: 18 April 2023
Pages: 757–771

Title: **Prediction of Compression Ratio of I.C. Engine Selective Assembly Using Adaptive-Neuro Fuzzy Inference System**
Authors: **Dinesh Y Dhande** & **Shrikant V Chaitanya**
AISSMS College of Engineering, Pune, 411001, India
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Publication date: 25 April 2023
Pages: 773–785

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Authors: **Harshita Khandle** & **Neeraj Kanwar**
Manipal University, Jaipur, India
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Publication date: 01 May 2023
Pages: 787–812

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Authors: **Deivaraja Ramasamy**
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DOI: https://doi.org/10.1007/s40031-023-00880-5
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Pages: 813–819

Title: **Enhancing the Power Quality of Grid Connected Photovoltaic System during Fault Ride Through: A Comprehensive Overview**
Authors: **Nishij G Kulkarni** & **Vasudeo B Virulkar**
Department of Electrical Engineering, M B E Society's, College of Engineering, Ambajogai, Beed, Maharashtra, 431517, India
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Authors: **Mit Piyush Bakhai**
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DOI: https://doi.org/10.1007/s40032-023-00938-9
Publication date: 30 March 2023
Pages: 467–477

Title: **A Finite Element Model-Based Approach for Rotor Unbalance Detection and Balancing**
Authors: **Dinesh Kumar Pasi**, **Manoj Chouksey** & **Ashesh Tiwari**
Department of Mechanical Engineering, Shri G. S. Institute of Technology and Science, Indore, India
Mechanical Engineering Department, IET-Devi Ahilya University, Indore, India
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Title: **Design and Development of Fixture for Flexural Testing of Lumbar Spine**
Authors: **Shantanu Kumar Das** & **Praveen Nagesh**
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Title: **Evaluation of Whole-Body Vibrations Effect on Tractor Driver in Indian Agricultural Conditions Using 4-Layered CAD Model**
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Department of Mechanical Engineering, Chandigarh University, Sahibzada Ajit Singh Nagar, India
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DOI: https://doi.org/10.1007/s40032-023-00933-0
Publication date: 18 March 2023
Pages: 503–512

Title: **Experimental Investigation of Thermal Behavior of Un-treated and Chemically Treated PF-Based**

Title: **Wood Polymer Composite**

Authors: **B T Ramesh**, **R S Ramesh** & **Arunkumar Bongale**
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Title: **Fabrication and Mechanical Property Investigation of Banana/Glass/Epoxy Hybrid Composites**

Authors: **Sandeep Tiwari**, **Chetan Kumar Hirwani** & **Asim Gopal Barman**
Department of Mechanical Engineering, National Institute of Technology, Patna, 800005, India
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Publication date: 30 March 2023
Pages: 521–527

Title: **Heat Transfer Analysis in Constructal Designed Microchannels with Perforated Micro Fins**

Authors: **N Y Godi** & **M O Petinrin**
Department of Mechanical Engineering, University of Cape Town, Private Bag X3, Rondebosch, 7701, South Africa
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DOI: https://doi.org/10.1007/s40032-023-00943-y
Publication date: 20 April 2023
Pages: 529–540

Title: **Modeling of Critical Food Supply Chain Drivers Using DEMATEL Method and Blockchain Technology**

Authors: **Santosh Patidar**, **Vijay Kumar Sukhwani** & **Apratul Chandra Shukla**
Department of Mechanical Engineering, Ujjain Engineering College, Ujjain, 456010, Madhya Pradesh, India

DOI: https://doi.org/10.1007/s40032-023-00941-0
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Pages: 541–552

Title: **Parametric Instability Control of Porous Functionally Graded Beam using Piezoelectric Actuators**

Authors: **Rajidi Shashidhar Reddy**, **Abhay Gupta** & **Satyajit Panda**
Department of Mechanical Engineering, Indian Institute of Technology Guwahati, Guwahati, 781039, India
Department of Mechanical Engineering, Alliance University, Bengaluru, India

DOI: https://doi.org/10.1007/s40032-023-00937-w
Publication date: 08 April 2023
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Title: **Research on Hot Extrusion Process of SiCp/Al Composites**

Authors: **Jigong Du**, **Bin Wang**, **Yunshuo Cao** & **Li Zhou**
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Pages: 563–579

Title: **Research on the Relationship Between Entrepreneurial Competency and Entrepreneurial Performance of University Students Through Factor Analysis**

Authors: **Xuerui Chang**
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DOI: https://doi.org/10.1007/s40032-023-00951-y
Publication date: 19 April 2023
Pages: 581–585

Title: **Salt Water Corrosion Behaviour of Composite Coated Al-6061 Developed Through HVOF**

Authors: **M K Srinath**, **J Nagendra**, **M Ravikumar**, **K D Bopanna**, **S Sujith Swamy** & **C Rakesh**
Mechanical Engineering Department, New Horizon College of Engineering, Bangalore, India

DOI: https://doi.org/10.1007/s40032-023-00950-z
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Pages: 587–592

Title: **Simulation and Experimental Assesment of Acrylonitrile Butadiene Styrene Polymer based New Lattice Design**

Authors: **Ali Imran Ansari** & **Nazir Ahmad Sheikh**
Mechanical Engineering Department, National Institute of Technology, Srinagar, India

DOI: https://doi.org/10.1007/s40032-023-00928-x
Publication date: 17 March 2023
Pages: 593–604

Title: **Solution Reduction of a Dynamic Plates Bending Problem to the Sequential Solution of the First Kind Fredholm Integral Equations**

Authors: **M M Mirzaeva**, **G O Tajibaev**, **N N Abdurazakov** & **L Turgunova**
Andijan State University, Andijan, Uzbekistan

DOI: https://doi.org/10.1007/s40032-023-00916-1
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Authors: **Nabila Khayer**, **Joydev Karmakar Rahul** & **Souvik Chakraborty**
Department of Industrial & Production Engineering, Rajshahi University of Engineering & Technology, Kazla, Rajshahi, 6204, Bangladesh

DOI: https://doi.org/10.1007/s40032-023-00923-2
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Pages: 613–628

Title: **Paint Shop Productivity Improvements with Offline Programming: A Case Study**

Authors: **Md Anees Khan**, **Dilip Kumar Sahu** & **Ashutosh Kumar Sengar**
Department ER and D, Tata Technologies, Jamshedpur, India
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Title: **Effect of Form Defect in Thin-Walled Cylinder Assembly**
Authors: **Allal Bedlaoui** & **Hamid Boutoutaou**
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Title: **Factors Affecting the Fatigue Behavior of Fiber-Reinforced Polymer Matrix Composites**
Authors: **C Hemanth Kumar**, **Arunkumar Bongale** & **C S Venkatesha**
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University B.D.T College of Engineering, Davangere, India
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Title: **Study of Image-Based Finite Element Model for Predicting the Biomechanical Properties of Femur Bone: A Review**
Authors: **Rahul Gujar**, **Hemant Warhatkar** & **Amit Kale**
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** Copy of Certificate of the Grant of Patent*

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| (x) | Name of Journal/Proceeding/Technical Volume | |
| (xi) | Volume No (Not required for Indian Engineering Congress) | |
| (xii) | Issue No (Not required for Indian Engineering Congress/Annual Technical Volumes of IEI) | |
| (xiii) | Theme (Only for Technical Volumes of IEI) | |
| (xiv) | DOI: (Not required for Indian Engineering Congress/Annual Technical Volumes of IEI) | |
| (xv) | ISSN | |
| (xvi) | Date of Publication (Date-Month-Year) | |
| (xvii) | Co-authors (if any) | |
| (xviii) | Abstract in full | |
| (xix) | 5/6 Keywords | |
| (xx) | Supporting Documents/links [which are clearly indicative of the incumbent's achievement(s)] | |

** publications in local seminar, conference and symposia will not be accounted*

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| (ix) Title of Book | |
| (x) Title of Book Chapter | |
| (xi) Book Chapter Number | |
| (xii) Publisher Details | |
| (xiii) ISBN | |
| (xiv) Date of Publication (Date-Month-Year) | |
| (xv) Co-authors (if any) | |
| (xvi) About the book (100-150 words) | |
| (xvii) Supporting Documents (complimentary copies for IEI Headquarters)/links [which are clearly indicative of the incumbent's achievement(s)] | |

** accommodate works published in journals/reputed conference proceedings/books for the last one year*

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Volume 8 | Issue 7 | July 2023

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# Engineering Staff College of India

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## CONTINUING PROFESSIONAL DEVELOPMENT PROGRAMMES (CPDP) FOR THE MONTH OF August 2023

| Sl. No. | Name of the Course | Scheduled Dates |
|---|---|---|
| 1. | Mechanical Design and Rotor Dynamics of Rotating Machines | 01 - 03 Aug 23 |
| 2. | Pilferage of Electricity - Detection & Prevention - Issues & Challenges | 01 - 04 Aug 23 |
| 3. | E-Waste Management-Issues, Collection and Disposal Mechanism | 02 - 03 Aug 23 |
| 4. | Advanced Excel for Report Generation & Analytics | 02 - 04 Aug 23 |
| 5. | Recent Trends in Design, Construction & Maintenance of Rigid Pavements | 07 - 11 Aug 23 |
| 6. | Urban Water Supply System and WTP | 07 - 11 Aug 23 |
| 7. | Cyber Security for Industrial Control System(ICS) and Intelligent Electrical Devices (IED) | 07 - 10 Aug 23 |
| 8. | Latest Technology in Mine Surveying - Total Station, DGPS,3D Laser Scanner, LiDaR, Drones, GIS, Remote Sensing Demonstration and Hands- on Training on Instruments | 07 - 11 Aug 23 |
| 9. | Project Management using MS Project and Primavera Software | 07 - 11 Aug 23 |
| 10. | Maintenance Welding for Technical Officers, Engineers, and Scientists | 08 - 11 Aug 23 |
| 11. | Substation Automation and Smart Grids | 08 - 11 Aug 23 |
| 12. | Training on Risk Management for Senior & Middle Level Managers at Jim Corbett | 08 – 10 Aug 23 |
| 13. | Coastal zone Management and Monitoring with remote sensing applications including CRZ 2018 draft notification | 16 - 18 Aug 23 |
| 14. | Machining Aerospace Materials - Challenges and Solutions | 16 - 18 Aug 23 |
| 15. | Environmental Issues, Challenges and Pollution Control Strategies in Thermal Power Plants (Online) | 16 - 18 Aug 23 |
| 16. | Rehabilitation of Bridges using latest Techniques & Risk Criteria | 21 - 25 Aug 23 |
| 17. | Working with BOSS Linux & Libre Office (Online) | 21 - 25 Aug 23 |
| 18. | Cyber Security & Digital Forensic Tools | 21 - 25 Aug 23 |
| 19. | Digital Surface Modeling using GIS Techniques-Hands on Practice | 21 - 25 Aug 23 |
| 20. | Heat Treatment - Furnaces, Processes and Innovations | 22 - 24 Aug 23 |
| 21. | IT Enabled Applications in Water Supply and Sewerage Projects. | 22 - 25 Aug 23 |
| 22. | Operation and Maintenance of Bulk Material Handling Equipment | 22 - 24 Aug 23 |
| 23. | Cost reduction by Energy Auditing, Management & Design of Solar Energy Systems (Online) | 22 - 25 Aug 23 |
| 24. | Finance for Non-Finance Executives at Ramoji Film City(Hyderabad) | 22 – 24 Aug 23 |
| 25. | Mine Safety & Health of Miners | 23 - 25 Aug 23 |
| 26. | Statistical Quality Control and Statistical Process Control | 23 - 25 Aug 23 |
| 27. | Advanced Course on Effective Spare Parts Inventory Management | 28 - 31 Aug 23 |
| 28. | Generator & its Auxiliaries incl. Excitation System | 28 - 31 Aug 23 |
| 29. | Hands on Training on Advanced & Basic Excel at Udaipur | 28 – 30 Aug 23 |
| 30. | Climate change, Public policy and governance-mitigation & adaptation | 29 - 31 Aug 23 |

# Admissions Open for AICTE Approved PGDM Courses by ESCI Hyderabad

Volume 8 | Issue 7 | July 2023

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