

# IEI Epitome

Volume 8 | Issue 4 | April 2023

*A Century of Service to the Nation*

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**Special Contribution**

Mr S Chakraverty, Dr K Sen, Mr D Nath, Mr A Das,  
Mr S Bagchi, Mr P Barik, Ms P Nath, Mr S K Mishra

**Design & Outlay**

Ms H Roy

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Telephone : 91-33-40106299/248

E-mail : newsletter@ieindia.org

Website : <http://www.ieindia.org>

# 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 pro-forma available in our website [www.ieindia.org](http://www.ieindia.org), should be sent through email to [research@ieindia.org](mailto: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.

# Notification for IEI Young Engineers Award 2023-24

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The Institution of Engineers (India) is a multi-disciplinary professional body of engineers with 15 engineering disciplines and over 9,00,000 members in India and abroad. The Institution was established in 1920 and was incorporated by Royal Charter in 1935. It has been in the forefront of engineering profession addressing the social engineering problems for progress of the country. IEI functions among professional engineers, academicians, research workers to update their professional knowledge through continuous professional development. IEI, with its large international linkages and a network of 125 Centres in India and six Overseas Chapters, has built up wide reach and large infrastructure to meet its objectives of promoting engineering in all aspects.

IEI, with a view to promote the pursuit of excellence in the field of engineering, has instituted '**IEI Young Engineers Award**'. The Award consists of a Plaque and a Certificate. The purpose of the Award is to recognize outstanding achievements /contributions made by young engineers in engineering research, excellence in engineering technology development, technology transfer, etc. Any engineer citizen of India **not older than 35 years of age as on March 31, 2023** is eligible for the Award. The IEI Young Engineers Award is presented to awardees for all the 15 Engineering Divisions of the IEI during the respective National Conventions. The awardees attending the National Convention will be provided with free accommodation & their travelling expenses (AC-3 Tier train fare by shortest route) will be reimbursed on production of original documents.

**The last date of receipt of application for 'IEI Young Engineers Award 2023-24' has been extended. The cut off date is 30 May 2023.**

The Application Proforma may be downloaded from IEI website (<https://www.ieindia.org>). Soft copy of the filled-in application proforma should be forwarded to [award@ieindia.org](mailto:award@ieindia.org). Six copies of the duly filled application form, along with all supporting documents, endorsed by appropriate authority should be sent to the below mentioned address:

**Director (Technical)**

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

The envelope containing the application should be superscribed at the top as '**IEI Young Engineers Award 2023-24**' and name of the engineering division under which the applicant desires to be considered for the Award.

# Members in the News

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## Mr Venkataramana Heggade, FIE

Former Director, Engineering  
Assystem STUP

✉: [vnheggade@gmail.com](mailto:vnheggade@gmail.com), [vnheggade@yahoo.co.in](mailto:vnheggade@yahoo.co.in)

Mr V N Heggade has been honoured as an **fib Fellow in 2023** from India by the *fib* Jury.

This distinction is given in recognition of his significant personal contributions to the work of the *fib*.

His *fib* Fellow recognition will be presented during opening ceremony of the **fib Symposium** on **5 June 2023** in **Istanbul, Turkey**.

## Dr V Rama Krishna, FIE

Scientist-F & Additional Director

Naval Science & Technological Laboratory, Defence Research and Development  
Organisation, Ministry of Defence, Visakhapatnam, Andhra Pradesh

✉: [ramki40@gmail.com](mailto:ramki40@gmail.com)



Dr Rama Krishna received the **Best Paper Award 2023** for presented his article “**Prediction of a 5 Bladed Underwater Marine Propeller Noise by Hub Modification**” during **50th National Symposium on Acoustics (NSA 2023)** on focal theme “**Emerging Trends in Acoustical Science, Design and Technology**” on **26 February 2023** at **Veer Surendra Sai University of Technology (VSSUT), Burla, Sambalpur, Odisha**.



## Mr Rao Y Mannepalli, FIE

Chief Scientist  
Leidos, USA

✉: [raoym@ieee.org](mailto:raoym@ieee.org)

Presented an invited paper “**Experiences in Developing the Digital Twins of Mission Critical Aerospace Systems**” at The International Conference on Vibration Engineering, Science and Technology (INVEST-2022) during 9-10 December 2022.

Delivered a Keynote Lecture “**Advances in Acoustics, Measurement, and Analysis of Aerospace Systems during the Past 60 Years**” at the 50th National Symposium on Acoustics (NSA-2023) during 24-26 February 2023.

## Books



**Mr Ashok Sethuraman, MIE**

BEE Accredited Energy Auditor

✉ [ashok@energymeasuretosave.com](mailto:ashok@energymeasuretosave.com)

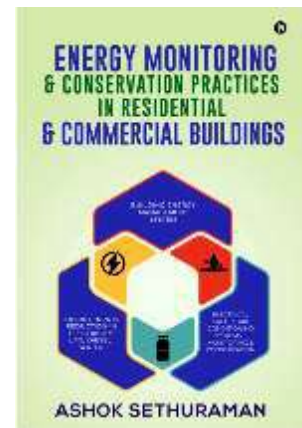
### **ENERGY MONITORING & CONSERVATION PRACTICES IN RESIDENTIAL & COMMERCIAL BUILDINGS**

#### **About the Book**

This book focuses on the practices towards energy monitoring and conservation in the residential and commercial building segment. Energy conservation in buildings is a prime area of interest since buildings consume 40% of the total energy that we use globally. This book will guide each energy consumer of the building to save energy by operating safely, and millions of consumers in residential & commercial segment can implement this electricity & other energy-saving exercises today. This will stabilize the prevailing the electricity supply-demand balance in the region and helps the nation to tide over crisis.

Building infrastructure wise, the scope for energy savings has to be embedded in the building architecture. Energy-efficient equipment has to be procured by the building user while commissioning the building. The same energy-efficient equipment should be used modestly, economically, rationally and optimally to suit the adequate comforts for the occupants, as well as to embrace the natural surroundings of the building. This book prioritizes the monitoring of input energy consumption to all the utility equipments in the building so as to target the reduction in energy consumption.

**ISBN:** 978-1-68586-683-9  
**Date of Publication:** 18 November 2021  
**Publisher:** Notion Press Media Pvt Ltd, Chennai  
**Price:** ₹279 (Paper back)



### **ENERGY CONSERVATION & MANAGEMENT IN TEXTILE MILLS**

**THIS PRACTICAL GUIDE IS BASED ON THE FIELD EXPERIENCE FROM THE FEW HUNDREDS OF ENERGY AUDITS IN TEXTILE MILLS**

#### **About the Book**

This book not only speaks of reducing energy proportion with respect to varying production levels, but also asserts that this is wake-up call to the textile mills to overlap your maintenance practices from time-and safety-based practices to the condition monitoring & predictive-maintenance-based practices in your workings of production and utility machines.

Many mills can still achieve the low-hanging fruits in energy conservation in their premises, and this book will facilitate the implementation of the same. The book has many case studies on how mills that have already done the low-cost energy conservation measures and how the same energy savings can be implemented in your textile mills now.

**ISBN:** 978-1-63850-891-5  
**Date of Publication:** 13 April 2021  
**Publisher:** Notion Press Media Pvt Ltd, Chennai  
**Price:** ₹349 (Paper back)





# Publication by Members

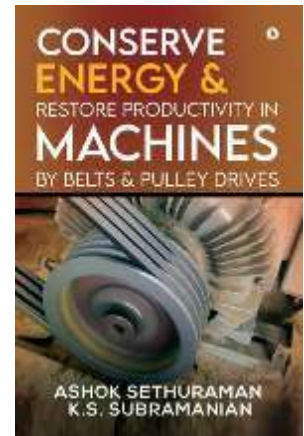
Volume 8 | Issue 4 | April 2023

## CONSERVE ENERGY & RESTORE PRODUCTIVITY IN MACHINES BY BELTS & PULLEY DRIVES

### About the Book

This book brings out the visible low hanging fruits of belt and pulley related energy losses in your daily working machine. By implementing the 'few-months-only-as-payback-proposals' based case studies given in this book, your industry can restore the productivity in production machines, which are mostly constant torque loads. Also, you can achieve appreciable energy savings by optimizing the speed demanded by variable torque loads like centrifugal blower, fan and pump.

**Co-author:** K S Subrmanaian  
**ISBN:** 978-1-63974-627-9  
**Date of Publication:** 15 July 2021  
**Publisher:** Notion Press Media Pvt Ltd, Chennai  
**Price:** ₹199 (Paperback)



## Be proud to be an IEI Certified Professional Engineers (PE) and International Professional Engineers (IntPE)

### Professional Engineers (PE) Certification by IEI

#### ELIGIBILITY REQUIREMENT

- BE / BTech or equivalent recognised by Statutory Authority or Government of India
- Five years or more professional experiences
- Membership of recognised professional engineering institution/ association
- Maintained Continued Professional Development (CPD) at a satisfactory level

For details pls visit the following link :

[https://www.ieindia.org/webui/IEI\\_PE\\_Certification.aspx](https://www.ieindia.org/webui/IEI_PE_Certification.aspx)

### International Professional Engineers (IntPE) Certification by IEI

#### ELIGIBILITY REQUIREMENT

- BE / BTech or equivalent recognised by Statutory Authority or Government of India
- Seven years or more professional experiences
- Minimum two years professional experience in significant engineering activity
- Membership of recognised professional engineering institution/ association
- Maintained Continued Professional Development (CPD) at a satisfactory level

For details please visit the following link:

[https://www.ieindia.org/webui/IEI\\_IntPE\\_Certification.aspx](https://www.ieindia.org/webui/IEI_IntPE_Certification.aspx)

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

# Publication by Members

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**Mr M Suresh Babu, FIE**

Architectural Engineer

✉ [surab99@rediffmail.com](mailto:surab99@rediffmail.com); [surab99@gmail.com](mailto:surab99@gmail.com)

## DREAM DIALOGUE JOURNEY

### ARCHITECT WHO RECREATES WORLD AROUND US

#### About the Book

World is undergoing tremendous changes rapidly and the role of a designer has to adjust its purpose, direction and speed.

Design is emerging as very powerful tool and can be used for destruction or can be used for fighting against injustice, poverty, pollution, environmental degradation.....

As architects we must use it for making our surroundings and neighborhoods better using principles like new urbanism and walk to work.

Unfortunately many architects forgets his responsibilities.

Younger generations are confused and see this profession as sinking ship.

My story start with a girl studying in architecture undergoes various processes like lectures, studio program, thesis and internship and discover the potential. She further involves in an international competition, large mixed use project, sustainable new township, urban rejuvenation scheme and a redevelopment of most congested, highly populated and dilapidated building area of Mumbai.

She revisits this area after 10 years and for her amusement find the difference in quality of life.

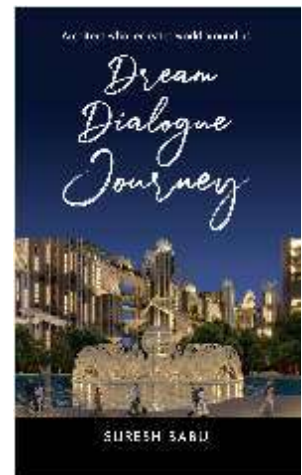
This book will also highlight the importance of frugal innovations and inter disciplinary collaborations for alternative ways of development in the future.

**ISBN:** 978-1-63640-356-4

**Date of Publication:** 2021

**Publisher:** White Falcon Publishing, Chandigarh

**Price:** ₹350.00 (Paperback)



## IEI-Springer Journal



ISSN Print 2250-2149  
ISSN Electronic 2250-2157

### Series A

CiteScore 2021

1.6

Google Scholar h5 Index 2021

16



ISSN Print 2250-2106  
ISSN Electronic 2250-2114

### Series B

CiteScore 2021

1.6

Google Scholar h5 Index 2021

17



ISSN Print 2250-0545  
ISSN Electronic 2250-0553

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CiteScore 2021

2.3

Google Scholar h5 Index 2021

20



ISSN Print 2250-2122  
ISSN Electronic 2250-2130

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Google Scholar h5 Index 2021

13



ISSN Print 2250-2483  
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### Series E

CiteScore 2021

1.3

Google Scholar h5 Index 2021

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## Papers published in the Journals / Proceedings



### Dr Jitendra Mohan Giri, FIE

Head

Department of Mechanical Engineering, Lloyd Institute of Engineering and Technology, Greater Noida, Uttar Pradesh

✉ [jmgiri.me@gmail.com](mailto:jmgiri.me@gmail.com)

#### **Title of Paper: Severe Plastic Deformation: A State of Art**

Materials Today: Proceedings, Elsevier, 2023, ISSN 2214-7853

DOI: <http://dx.doi.org/10.1016/j.matpr.2023.02.194>

**Co-authors:** Harish Kumar, Kiran Devade, Durgeshwar Pratap Singh, Manish Kumar & Vanya Arun

**Abstract:** The proposed application of the study on severe plastic deformation (SPD), also known as Nano-SPD, is to provide a comprehensive overview of the recent advancements and developments in the field. The focus of the study is to highlight the various continuous processes used for producing ultrafine-grained and nanostructured materials, such as equal-channel angular pressing, high-pressure torsion, twist extrusion, accumulative roll-bonding, and multi-directional forging. The study also aims to demonstrate the versatility of SPD in processing a wide range of materials, including semiconductors, alloys, glasses, polymers, ceramics, and composite materials. Furthermore, the study highlights the potential of SPD in stabilizing metastable states and synthesizing novel materials with superior functional and mechanical characteristics. The proposed application of the study is to provide a comprehensive and up-to-date review of the advancements and developments in the field of Nano-SPD and to highlight its potential in producing advanced materials with enhanced properties. This study is expected to be useful for researchers, engineers, and material scientists working in the field of materials science and engineering.

**Keywords:** Severe Plastic Deformation; Ultrafine Grain; High-Pressure Torsion; High Strength; Corrosion Resistance

#### **Title of Paper: Effects of Alloying Element on the Mechanical behavior of Mg-MMCs: A Review**

Materials Today: Proceedings, Elsevier, 2023, ISSN 2214-7853

DOI: <http://dx.doi.org/10.1016/j.matpr.2023.02.211>

**Co-authors:** Santosh Walke, V M Kale, Pravin P Patil, Harish Kumar, Manish Kumar & Vanya Arun

**Abstract:** Due to their superior mechanical qualities and high strength-to-weight ratio when compared to unalloyed magnesium, magnesium alloys are widely used in a variety of applications. While maintaining control over the rate of corrosion for materials made of magnesium is crucial in the biological environment. Prior to controlling the degradation rate, Alloying is evaluated as the most essential way to enhance the corrosion and mechanical characteristics of the composites on comparing to the unalloyed material. Therefore, it is a pre-requisite to decide on the suitable alloying element to be added to the metal matrix composite that has a positive influence on the material property. In selecting the alloying elements, biocompatibility, biodegradability, less stress shielding effect, bio-activeness, and non-toxicity are the important parameters for biomedical applications other than mechanical and corrosion properties. The current study evaluated the various alloying elements in the Mg-based materials including Al, Ca, Al, Zn, rare earth (RE), Mn, Bi, Zr, Si, Ag, Zn, Ca, etc in a detailed version.

**Keywords:** Magnesium; Unalloyed; Corrosion; Bioactive; Non-toxicity; Alloying

#### **Title of Paper: Simulated Annealing and Its Applications to Mechanical Engineering: A Review**

International Journal of Innovative Research in Computer Science & Technology, 11, Special Issue -1, 2023, ISSN: 2347-5552

DOI: <https://doi.org/10.55524/NCDICM.2023.11.1.3>

**Abstract:** This work focuses on the significant family of stochastic approaches for global optimization known as simulated annealing (SA), which is based on the key concept of annealing, which describes the cooling of a solid until it reaches the configuration of lowest energy. This paper presents a review of simulated annealing applications meant to solve many problems in the field of mechanical engineering.

**Keywords:** Simulated Annealing; Optimization; Meta-heuristics; Mechanical Engineering



# Publication by Members

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## Mr Jnan Ranjan Pal, FIE

Chief Engineer (Retd)

Irrigation Department, Locknow, Uttar Pradesh

✉ [jrpal0909@gmail.com](mailto:jrpal0909@gmail.com)

### Title of Paper: **Smart Village for Achieving SDGs and Sustainable Development of India**

Technical Volume of 37th Indian Engineering Congress, IEI, Theme: 'Role of Engineers for Creating a Sustainable & Self-Reliant India', December 2022, pp 153-156, ISBN 978-81-955500-5-0

URL: [https://www.ieindia.org/webui/ajax/Downloads/WebUI\\_PDF/IEC/IEC\\_37.pdf?v20221220.1](https://www.ieindia.org/webui/ajax/Downloads/WebUI_PDF/IEC/IEC_37.pdf?v20221220.1)

**Abstract:** India and Indian cities cannot become smart if the villages of India are not smart. Every city is surrounded by some villages. These villages should be clean. Role of water and energy in rural transformation is vital. The importance of water, sanitation and health collectively cannot be ignored to make a smart village. Union Government's Ujjala Yojna to provide cooking gas to every household of villages and Swachh Bharat initiative to construct toilet in every house of a village are the steps towards making a smart village (SDG Target 6.2, End open defecation and provide access to sanitation and hygiene). Construction of low-cost houses under Pradhan Mantri Aavas Yojna are strengthening the concept of Smart Villages (SDG Target 11.1, safe, affordable housing and basic services to all). The 193 member states of the United Nations adopted 17 new Sustainable Development Goals (SDGs) as a unanimous commitment to end poverty, fight inequalities and injustice and tackle climate change. The goals are to be achieved by 2030. SDG 6 deals with all aspects of water availability, accessibility and use, and calls upon all nations to "Ensure availability and sustainable management of water and sanitation for all". Target 7.1 and 7.2 ensure universal access to affordable, reliable and modern energy services, by increasing substantially the share of renewable energy.

The rural and urban societies are in fact complementary to each other. The industrial growth needs vast consumer base, which is easily provided by the urban and rural masses and agricultural production by the rural masses, is an essential requirement of the urban population. So that they can grow together while supporting each other. If the young boys and girls of our villages compelled to rush to urban parts for their education, and employment, who will work in the fields. If the best health care facilities are located only in the cities, then how do we expect the people to stay in village.

To achieve the target of doubling the agricultural productivity and income of small-scale food producers, (Target 2.3) and increasing productivity by implementing resilient agricultural practices, (Target 2.4) would be at the cost of universal access to safe drinking water (Target 6.1) and restoring water related eco-system, (Target 6.6). Hence in case of smart village Target 2.3 and 2.4 need to be taken forward along with Target 6.4 (water use efficiency).

In its first assembly in New Delhi in March 2018, International Solar Alliance (ISA), was formed by solar-resources rich countries to undertake joint efforts to reduce cost of finance and technology for development of at least 1000 GW, solar energy worldwide by 2030 (Target 7.1). Hydro-electric power is a renewable source of energy, which has immense potential in India, which can be harnessed to mitigate electricity shortage in India, both in urban and rural areas and even out the variability added to the grid system, due to solar and wind power generation (Target 7.2). Apart from the fact that water used for hydropower generation is non-consumptive in nature and is used for many purposes in the downstream of the project, such as irrigation, drinking water supply, restoration of forests (Target 15.1), and increase afforestation (Target 15.2) etc.

**Keywords:** Smart Village; Water; Sanitation; Health; Agriculture; Energy; Sustainable Development Goal



## Dr Nilaj N Deshmukh, FIE

Dean (Faculty) & Head of Mechanical Engineering Department

Fr C Rodrigues Institute of Technology, Sector 9A, Vashi, Navi-Mumbai, Maharashtra

✉ [nilaj.deshmukh@fcrit.ac.in](mailto:nilaj.deshmukh@fcrit.ac.in)

## **Title of Paper: Effect of Geometrical Parameters and Use of Porous Material in a Helmholtz Resonator on Suppression of Thermo-Acoustic Instabilities**

International Journal of Spray and Combustion Dynamics, SAGE Journal, 2023, ISSN: 1756-8277, Online ISSN: 1756-8285

DOI: <https://doi.org/10.1177/17568277231158900>

**Co-authors:** Afzal Ansari, Sharvil Degwekar, Benson Paul & Rohit Unnikrishnan

**Abstract:** Thermo-acoustic instabilities are mainly formed due to in-phase superposition of non-uniform heat release and pressure variation in the combustors of gas turbines, rocket engines and other acoustically confined spaces. These instabilities not only damage the structural system but also reduce its combustion efficiency and heat transfer rate. Hence suppression of thermo-acoustic instabilities is a prominent requirement for stable and safe heat generation in the combustors. In this work, the Helmholtz resonator has been used to suppress the instability. The efficacy of the resonator has been further increased by the addition of absorptive material to it. This work concentrates on inspecting the influence of cavity volume, neck length and neck diameter of the Helmholtz Resonator and the thickness of the absorptive material in the damping process of thermo-acoustic instabilities. The experimentation was carried out for various combinations of resonator cavity volume, neck diameter and neck length, and the best combination was found to be 6 mm neck diameter with 20 mm neck length at 60% volume which provided an acoustic damping of around 30 dB. Further, it was noticed that the addition of absorptive material is effective at lower volumes of Helmholtz resonator, and with an increase in thickness of absorptive material beyond a certain limit, the damping ability of the resonator reduces.

**Keywords:** Thermo-Acoustics Instabilities; Acoustic Waves; Rijke Tube; Passive Control; Helmholtz Resonator; Absorptive Material



**Dr Tharun Dolla, MIE**

Assistant Professor

Department of Civil Engineering, GITAM Deemed to be University, Gandhi Nagar, Rushikonda, Visakhapatnam, Andhra Pradesh

✉ [tharun.dolla@gmail.com](mailto:tharun.dolla@gmail.com)

## **Title of Paper: Strategies for Digital Transformation in Construction Projects: Stakeholders' Perceptions and Actor Dynamics for Industry 4.0**

Journal of Information Technology in Construction (ITcon), 28(8), 2023, pp 151-175, ISSN: 1874-4753

DOI: <https://doi.org/10.36680/j.itcon.2023.008>

**Co-authors:** Venkata Santosh Kumar Delhi & Karuna Jain

**Abstract:** This study explores and presents the roadmap of industry 4.0 for the Indian construction industry with particular reference to project management practices. Accordingly, this study explores stakeholder dynamics for adopting digital technologies in the construction sector, especially those affecting construction project management. The study adopted one focus group with five participating panellists that provided the qualitative data. This is followed by a questionnaire survey with wider practitioners from the public and private sectors to validate the findings and rank the hypothesis to enable the implementation. Based on a focus group, this study proposes thirteen hypotheses describing stakeholders' dynamics. Furthermore, based on the questionnaire survey validation, this study finds that the top four strategies are stakeholder integration, process re-engineering, training activities, and the need to generate federated data. We interpret the journey of industry 4.0 in the construction industry as having its effect from at least four perception frames: redundancy, accommodation, amplification, and introduction. Practitioners can make process changes in their organisations while delivering projects using industry 4.0 in the construction sector. The findings are contextual to the Indian construction industry. While there is a richness of data that emanated from experienced practitioners, future case studies could enhance the applicability of the findings. The article takes a visionary stand to enable practical aspects of adopting industry 4.0 in its full measure.

**Keywords:** Project-based Organisations; Digital Transformation; Stakeholders' Perceptions; Actor Dynamics; Construction 4.0.



**Dr Subir Majumder, MIE**

TEES Senior Research Engineer I

Department of Electrical & Computer Engineering, Texas A&M University, College Station, TX, USA

✉ [subirmajumder@iitb.ac.in](mailto:subirmajumder@iitb.ac.in)

## **Title of Paper: Premium Power Investment Strategy Utilizing the Economy of Scale of Custom Power Devices**

Electric Power Systems Research, 214, Part A, 2023, Elsevier, ISSN: 1873-2046

DOI: <https://doi.org/10.1016/j.eprs.2022.108743>

**Abstract:** The possible existence of 'economy of scale' in manufacturing poor power quality (PQ) mitigation devices motivates customers to participate in a common mitigation solution. A custom power park (CPP) is an option where the CPP operator offers a set of custom solutions to a group of customers. Given that these custom solutions comprise one or many custom power devices, both CPP operators and the customers are expected to coordinate to obtain individual mitigation device ratings while maximizing the overall utility of customers. Here, CPP operators would calculate ratings of custom solutions and associated unit cost for the minimal total cost, while the customers are expected to select custom solutions to maximize their overall benefit. Furthermore, the customers utilize their willingness-to-pay function in this process and strictly participate in this arrangement if the utility received is more than their self-generated non-negative utility. Without the CPP operator, customers would form a CPP-like arrangement to recover the cost of investment and operation and maintenance. This combinatorial problem has been solved in two stages, involving the calculation of independently generated utility in the first stage and the overall CPP designing problem in the second stage. While customer and operator-side nonlinearities in the cost functions have been suitably discretized, the proposed methodology ensures that the solution space remains intact. The proposed method is illustrated using three devices, three custom solutions, and three customers.

**Keywords:** Combinatorial Optimization; Cost-benefit Analysis; Custom Power Park; Dynamic Voltage Restorer (DVR); Power Quality (PQ) Improvement; Static Compensator (STATCOM); Static Transfer Switch (STS)

## **Title of Paper: Chance-Constrained Pre-Contingency Joint Self-Scheduling of Energy and Reserve in a VPP**

IEEE Transactions on Power Systems, IEEE, 2023, Print ISSN: 0885-8950, Electronic ISSN: 1558-0679

DOI: <http://doi.org/10.1109/TPWRS.2023.3244919>

**Co-authors:** SAKhaparde, Ashish PAgalgaonkar, SV Kulkarni, Anurag K Srivastava & S Perera

**Abstract:** With the increasing penetration of primarily inertia-less distributed energy resources, allowable delay in the fast frequency reserve provision to ensure marginal stability condition can become comparable with the requisite dead-time for fast-switching in a radial power distribution system (PDS) connected to the transmission system. Consequently, the prevailing short-duration load-generation imbalance might propagate as system-wide frequency excursion in the future power system, which traditionally has not been observed. Furthermore, during the fast-switching, some of the fast-acting reserve (FAR) providing local generators remain inaccessible to the bulk power system (BPS). This work has answered the questions of requisite reserve requirements to cater to such events through efficient energy and FAR provision joint-scheduling. Stochasticity of fast-switching, with temporary faults as a use-case, requires modeling of load-generation imbalance and local resource unavailability, vis-à-vis FAR requirement problem, as a chance-constraint. Due to the limited visibility at the BPS level, PDS operators must ensure sufficient FAR availability for a given confidence level of the chance-constraint. Individual chance-constraints are used to ensure mathematical simplicity. Here, the PDS is operated as a virtual power plant (VPP), where the operator can procure resources locally or from the wholesale market with the aim of profit maximization before the contingency occurs. Results show that FAR requirements can influence the local energy schedule and raise energy costs. Furthermore, the confidence level of the chance-constraint can impact overall profitability, and FAR should be scheduled carefully. Comparative analysis with a modified benchmark IEEE 33-node radial test system and a 98-node test system shows the superior performance of the proposed approach. The impact of the limited available FAR is also demonstrated.

**Keywords:** Chance-Constrained Optimization; Day-Ahead Market; Fast-Switching; Joint-Scheduling, Low-Inertia Power System; Reserve Allocation; Virtual Power Plants (VPP)



## Dr Manikandan S, MIE

Associate Professor and Head

Department of Information Technology, EGS Pillay Engineering College,  
Nagapattinam, Tamil Nadu

✉ [profmaninvp@gmail.com](mailto:profmaninvp@gmail.com)

### Title of Paper: Performance Comparison of Various Wireless Sensor Network Dataset using Deep Learning Classifications

2022 IEEE 2nd International Conference on Mobile Networks and Wireless Communications (ICMNWC), 2023, pp 1-4, Electronic ISBN:978-1-6654-9111-2, Print on Demand (PoD) ISBN:978-1-6654-9112-9

DOI: <http://doi.org/10.1109/ICMNWC56175.2022.10032015>

Co-authors: N Poongavanam, V Vivekanandhan & T A Mohanaprakash

**Abstract:** Deep Learning is the subset of artificial intelligence and various techniques are available to predict the performance of real time applications. Wireless devices are available to access the devices from multiple places based environment and coverage area. Wireless sensor network (WSN) tools are positioned in multiple places which has sense the information from the substances. The performance is the major factor to facilitate the bandwidth and power. In this paper to analyse the wireless sensor network performance using deep learning techniques. Here to measure the performance indicators such as accuracy, precision and score function of sensor dataset using TensorFlow. The deep learning models such as convolutional neural networks, recurrent neural network and k-means neural network performance factors are classified by using sensory dataset. The accuracy factor is obtained as 96% and compares this with existing models.

**Keywords:** Deep Learning; Wireless Sensor Networks; Classification, Performance; Tensorflow



## Dr Abhishek Tiwari, MIE

Assistant Professor

Department of Metallurgical and Materials Engineering, Indian Institute of Technology  
Ropar, Rupnagar, Punjab

✉ [abhishek.tiwari@iitpr.ac.in](mailto:abhishek.tiwari@iitpr.ac.in)

### Title of Paper: Rate of Change of J-integral in Creep-fatigue Condition

Fatigue & Fracture of Engineering Materials & Structures, 2023, ISSN: 8756-758X

DOI: <https://doi.org/10.1111/ffe.13980>

**Abstract:** The operational conditions in next generation power plants and other high temperature applications such as turbine blades in jet engines demand the component to perform under extreme conditions where metallic materials show time dependent deformation under cyclic loading conditions. Under creep-fatigue loading condition, the crack tip is exposed to both time dependent and independent plastic deformation. Conventional crack characterizing parameters such as  $(C_t)_{avg}$  has shown good correlation with dominant damage-based crack velocity,  $(da/dt)_{avg}$ . However, the true definition or prediction of crack driving forces under such scenario are vague due to limited theoretical validity of the conventional crack tip characterizing parameters, such as J or  $C_t$ . In this work, the concept of configurational forces are applied for the first time to understand the creep-fatigue crack growth behavior. The crack growth is simulated using node-release technique and the configurational forces are calculated using post processing the finite element results for calculation of  $dJ/dt$ .

**Keywords:** Configurational Forces; Crack Driving Force; Creep-Fatigue Crack; Node Release





**Dr Mukesh Kumar Nag, AMIE**

Research Scholar

Mechanical Engineering Department, National Institute of Technology Jamshedpur, Jharkhand

✉ [nag0859@gmail.com](mailto:nag0859@gmail.com)

**Title of Paper: Synthesis and Characterization of High-Performance Blended Alkali-Activated Geopolymer (FA/GBFS) from Industrial Wastes**

Iranian Journal of Science and Technology, Transactions of Civil Engineering, Springer, 2023, Print ISSN: 2228-6160, Electronic ISSN: 2364-1843

DOI: <https://doi.org/10.1007/s40996-023-01044-7>

Co-author: Parmanand Kumar

**Abstract:** Ordinary Portland cement (OPC) has a major contribution to the increment of greenhouse gases due to its increased demand as a construction material. To overcome this problem, researchers are being done to partially replace OPC by utilizing industrial by-products, which are cheap, and eco-friendly. Geopolymer is a new material having binding properties almost resembling the OPC. In this paper, fly ash (FA) and ground-granulated blast furnace slag (GGBFS) were used for geopolymer synthesis. A series of fly ash-based geopolymers was synthesized with varying NaOH (6 M, 8 M and 10 M) concentrations by blending GGBFS in ambient conditions. Compressive strength results show that more than 40% GGBFS in the blend of fly ash and GGBFS gives the desired strength, i.e., more than 35 MPa in an alkali activation at 27 °C, with high (6 M, 8 M, 10 M) molarity of the NaOH solution. In the isothermal conduction calorimetry test, the maximum heat of hydration was observed in the sample with 8 M NaOH and minimum with 6 M NaOH solution. In the durability test, the performance of the 1:1 blended FA-GGBFS system shows that the loss in strength is increased with the increase in alkali concentration. Samples with 6 M NaOH have shown a minimum loss, which was increased in the sample with 8 M and 10 M. Similar to the aforementioned, the loss of strength and loss in mass in the sample increased with the increase in alkali concentration. Also, characterization of prepared geopolymer samples (A66M, A610M, A56M and A510M) was done by XRD and FTIR spectroscopy.

**Keywords:** Geopolymer; Fly Ash; Synthesis; Compressive Strength; Durability; Characterization

**Title of Paper: Fabrication and Characterization of Woven and Comingled Nonwoven Sheet Polypropylene Hybrid Composite by Recycling and Alkali-treated Jute Waste Fibers**

Proceedings of the Institution of Mechanical Engineers, Part C: Journal of Mechanical Engineering Science, SAGE Journal, 2023, ISSN: 0954-4062, Online ISSN: 2041-2983

DOI: <https://doi.org/10.1177/09544062221149388>

Co-author: Parmanand Kumar

**Abstract:** Natural fiber reinforced hybrid composite materials, with their enhanced characteristics, represent the future of our advanced material search. Natural fibers are the substitute for synthetics because their less manufacturing cost, bio-degradable, easy availability, durability, resistance to environmental degradation, etc., makes them popular nowadays. This paper presents how jute fibers are recycled from various jute waste sources. After recycling, jute fibers are used to fabricate the hybrid composites. Two forms of recycled jute sheets are used to fabricate the composites that is, woven sheets and nonwoven comingled (jute and polypropylene) sheets. The NaOH treatment was performed on recycled jute sheets with different concentrations (0%, 2%, 4%, 6%, and 8%). The hybrid composites are made using three distinct fiber-polypropylene weight fraction ratios (50/50, 40/60, and 30/70), as well as five different stacking sequences. Mechanical parameters such as tensile strength, elongation (%), flexural strength, impact strength, and water absorption were evaluated. Among the five fabricated combinations, it is found that the combination of (40/60), (JJJ), with 2% NaOH treated fibers composite gives the maximum tensile and flexural strength, and the combination of (30/70) (CCC) with 2% NaOH treated fiber composites exhibits the maximum Impact strength. The combination of (50/50), and (CCC) with 2% NaOH treated fiber composite gives the maximum Elongation %, and the combination of (50/50), (JJJ), and 0% NaOH treatment yields the maximum water absorption. A relationship between fabric loading, tensile modulus, and flexural modulus and other relationship between chemical treatment and water absorption% has been established for JJJ laminated sheet which shows almost best properties among them. These assessments make them most valuable for a variety of sectors, including car, aircraft, marine, and building construction.

**Keywords:** Natural Fibers; Hybrid Composite; Jute Waste Fiber; Recycling; Alkali Treatment; Mechanical Properties





**Mr Anand K Joshi, AMIE**

Research Scholar

Presidency University Bangalore, Karnataka

✉ [anandjoshi.mech@gmail.com](mailto:anandjoshi.mech@gmail.com)

**Title of Paper:** Numerical Analysis of Battery Thermal Management System Using Passive Cooling Technique

SAE Technical Paper, SAE International, United States, 2023, ISSN: 0148-7191, e-ISSN: 2688-3627

**DOI:** <https://doi.org/10.4271/2023-01-0990>

**Co-authors:** Devendra Dandotiya, C S Ramesh & Satyam Panchal

**Abstract:** Nowadays electric vehicle is replacing internal combustion engines in the transport sector. The growth of electric vehicles is increasing rapidly to reduce the impact of global warming and climate change. The battery limits the use of electric vehicles as an exact alternative to traditional IC engine vehicles. Specifically, the operating temperature, charge/discharge rates, and internal heat generation of the battery the performance of electric vehicles, like the driving range, charge storage capacity, the cycle life of the battery, and thermal runaway occurring at high temperatures. To overcome these problems, the battery thermal management system (BTMS) controls the temperature of the battery and maintains the optimal temperature to operate the battery efficiently and safely. In the heights of the above facts, the numerical analysis of 18650 Li-ion battery thermal management systems by passive cooling technology using Phase Change Material (PCM). The recent developments in battery thermal management systems, in particular, battery module analysis with and without PCM at different C rates, with and without fin are discussed at length.

Numerical Analysis using ANSYS FLUENT is carried out to determine the effect of the use of PCM on heat transfer in the battery module. Temperature distribution along the battery in the region of PCM with and without the use of fins of various geometries and their configuration are predicted. Among all the geometries studied, the use of "I" section fin had a profound beneficial effect on heat transfer leading to better performance of the battery.

**Keywords:** Li-ion Battery; Phase Change Material(PCM);Fin; Electric Vehicle(EV); Battery Thermal Management System (BTMS)



**Dr A Lakshmi, AMIE**

Associate Professor

Department of Electronics and Communication Engineering, Ramco Institute of Technology, Rajapalayam, Virudhunagar, Tamil Nadu

✉ [lakshmi@ritrjpm.ac.in](mailto:lakshmi@ritrjpm.ac.in)

**Title of Paper:** Clustering-based Image Segmentation for Optimal Image Fusion using CT and MRI Images

International Journal of Modeling, Simulation, and Scientific Computing, 2023, ISSN (print): 1793-9623, ISSN (online): 1793-9615

**DOI:** <https://doi.org/10.1142/S1793962324410010>

**Co-authors:** N Thenmozhi & B Perumal

**Abstract:** As opposed to using many unrelated photographs to depict the same scene, image fusions combine multiple, similar images to generate a single, unified image with greater detail. Imaging sensors and the need for a wideband signal to transmit most source images limit their resolution. This study suggests new methods of fusing medical pictures from different modalities in order to increase image quality and, by extension, the accuracy with which brain tumors can be detected and identified. Improved convolutional neural network (ICNN) and region growth-based K -means clustering (RKMC) are used in the suggested strategy to

# Publication by Members

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boost the quality of brain image fusions obtained from Computed tomography scanned image (CTSI) and magnetic resonance imaging (MRI) in this study. The first stages of this task consist of eliminating noise, segmenting images, extracting and selecting features, and fusing images. AMF (Adaptive Median Filtering) are first used to eliminate noise from MRI images and CTSI of the brain, improving the image quality. With the help of the RKMC algorithm, MRI image and CTSI scans can be segmented into their constituent pieces, which can then be seen either as grayscale images or as pictures of objects. The RKMC algorithm is able to adequately account for the possibility of tumors in white images. More useful image features can be extracted with the use of MPCA (Modified Principal Component Analysis). Afterward, features with the highest fitness values are chosen by using AFO (Adaptive Firefly Optimization). Image fusions of multimodal images are carried out using ICNN, which generates the image's lower-, middle-, and higher-level contents. Incorporating important and relevant image characteristics from all viewpoints and perspectives improves feature training and testing. The results show that the proposed RKMC+ICNNs outperform the state-of-the-art approaches in terms of accuracy, PSNR, RMSE, and runtime.

**Keywords:** Segmentation; Clustering; Computed Tomography; Magnetic Resonance Imaging; Features, Tumors; Deep Learning



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**Mr Devjit Acharjee, AMIE**

Ph D Scholar

Department of Construction Engineering, Jadavpur University, Kolkata, West Bengal

✉ [devjitacharjee1996@gmail.com](mailto:devjitacharjee1996@gmail.com)

**Title of Paper: Stability Assessment of a Real Life G+4 RCC Building Subjected to Corrosion**

Proceedings of the 37th National Convention of Civil Engineers & National Conference on “Emerging Technologies & Seismic Concerns”, IEI, 2022

**Co-author:** Anupam Alok

**Abstract:** RCC structures often undergo premature distress and deterioration due to faulty construction technique, usage of poor materials, inadequate quality control etc. One of the main causes of structural deterioration in RCC buildings appears to be the corrosion distress. There are a number of Non-Destructive Testing (NDT) procedures available to assess the condition of RCC structures for evaluation of the current strength & quality of concrete in terms of the development of internal cracks, and susceptibility to reinforcement corrosion in concrete. These various qualitative piece-wise test results of the RCC members of those structures, however, do not directly correlate with their global stability; particularly against the seismic load. The present paper aims to assess the stability of a real life G+4 RCC Building subjected to corrosion. To evaluate the extent of corrosion damage to the building, extensive non-destructive test data are investigated; and chemical analysis of concrete is also done. Numerical models of the existing building are developed in Finite Element Framework considering initial and corrosion damaged material properties. Linear and Non-Linear Static analyses results along with the Modal Characteristics are compared to evaluate the effect of corrosion on the stability of the RCC structure. The present study seems to have a great scope for its practical application to evaluate safety against seismic vulnerability and further repair feasibility for real life corroded RCC building structures.

**Keywords:** Corrosion; Finite Element Framework; Modal Characteristics; Non-Linear Static Analysis; Stability

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# Published Article in IEI Journals

Volume 8 | Issue 4 | April 2023



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

[Computer, Electrical, Electronics and Telecommunication Engineering]

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

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

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### Volume 104, Issue 2, April 2023

Title: **A Majority Voting Ensemble Approach for LULC Classification of Satellite Images**

Authors: **Keerti Kulkarni & P A Vijaya**

Department of Electronics & Communication Engineering, BNM Institute of Technology, Bangalore

DOI: <https://doi.org/10.1007/s40031-023-00865-4>

Publication date: 01 February 2023

Pages: 327–333

Title: **A Modified Artificial Neural Network (ANN)-Based Time Series Prediction of COVID-19 Cases from Multi-Country Data**

Author: **Babita Majhi**

Department of Computer Science and Information Technology, Guru Ghasidas Vishwavidyalaya, Central University, Bilaspur

DOI: <https://doi.org/10.1007/s40031-022-00849-w>

Publication date: 16 January 2023

Page: 335–350

Title: **Digital Twin for Image-Based Particle Pollutant Matter Prognosis**

Authors: **Pushpa Mala Siddaraju, Suhiepha Sameer, Sneha Shree Manjunath & Sneha**

Department of Electronics and Communication Engineering, Dayananda Sagar University, Kudlu Gate, Bengaluru, Karnataka

DOI: <https://doi.org/10.1007/s40031-023-00864-5>

Publication date: 22 February 2023

Page: 351–357

Title: **Empirical Wavelet Transform-Based Differential Protection Scheme for Micro-Grid**

Authors: **B K Chaitanya & Anamika Yadav**

Department of Electrical and Electronics Engineering, Chaitanya Bharathi Institute of Technology, Hyderabad;

Department of Electrical Engineering, National Institute of Technology, Raipur

DOI: <https://doi.org/10.1007/s40031-023-00869-0>

Publication date: 07 March 2023

Pages: 359–368

Title: **Evaluation of Ripplet Transform as a Texture Characterization for Iris Recognition**

Authors: **Suchitra Khoje & Sagar Shinde**

CS2S Technology Pvt. Ltd., Pune, 411041, Malvika Arcade, Narhe, Pune;  
Department of Electronics & Telecommunication Engineering, Dr D Y Patil Institute of  
Technology, Pimpri, Pune

DOI: <https://doi.org/10.1007/s40031-023-00863-6>

Publication date: 30 January 2023

Pages: 369–380

Title: **Experimentation with Novel Factors Affecting Earth Resistance Using Taguchi Method**

Authors: **Meghna Bhosale, P B Karandikar & N R Kulkarni**

Engineering Sciences Department, Marathwada Mitra Mandal's Institute of Technology,  
Pune;

Electronics and Telecommunications Department, Army Institute of Technology, Pune;

Electrical Engineering Department, P E S's Modern College of Engineering, Pune

DOI: <https://doi.org/10.1007/s40031-023-00856-5>

Publication date: 06 February 2023

Pages: 381–386

Title: **Insincere Questions Classification Using CNN with Increased Vocabulary Coverage of GloVe Embedding**

Authors: **Sumit Mishra & Neeraj Kumar**

Department of Electrical and Electronics Engineering, Bharati Vidyapeeth's College of  
Engineering, New Delhi

DOI: <https://doi.org/10.1007/s40031-023-00858-3>

Publication date: 27 February 2023

Pages: 387–394

Title: **Integration of Distributed Generations and Static VAR Compensator in a Distribution Network Using Genetic Algorithms**

Authors: **Vipul Shukla, Vivekananda Mukherjee & Bindeshwar Singh**

Indian Institute of Technology (Indian School of Mines), Dhanbad;

Kamla Nehru Institute of Technology, Sultanpur, Uttar Pradesh

DOI: <https://doi.org/10.1007/s40031-023-00860-9>

Publication date: 16 February 2023

Pages: 395–422

Title: **Mackey–Glass Chaotic Time Series Forecasting by Using Self-Organizing Fuzzy Inference Network**

Authors: **Myong-Song Choe, Kang-Song Ri, Kyong-Il Ryang, Un-Chol Choe & Chol-Guk Ri**

Faculty of Electronics & Automation, Kim Il Sung University, Pyongyang, Democratic  
People's Republic of Korea

DOI: <https://doi.org/10.1007/s40031-023-00855-6>



# Published Articles in IEI Journals

Volume 8 | Issue 4 | April 2023

Publication date: 18 February 2023

Pages: 423–432

Title: **Massive MIMO Channel Estimation Using FastICA Weighted Function for VLC in 5G Networks**

Authors: **R Sindhuja & Arathi R Shankar**

Department of Electronics & Communication Engineering, BMS College of Engineering, Bangalore

DOI: <https://doi.org/10.1007/s40031-022-00850-3>

Publication date: 23 January 2023

Pages: 433–440

Title: **Performance Analysis of Distribution System with PV Penetration Using Flower Pollination Algorithm**

Authors: **Atma Ram Gupta, Nandola Maitrey Bharatbhai & Jitendra Singh Bhadoriya**

Electrical Engineering Department, Shri Phanishwar Nath Renu Engineering College, Araria, Bihar;

Electrical Engineering Department, National Institute of Technology, Kurukshetra, Haryana

DOI: <https://doi.org/10.1007/s40031-023-00859-2>

Publication date: 31 January 2023

Pages: 441–459

Title: **Realization of Arithmetic Operations using a Combined Computational Unit in Ribosomal Computing**

Authors: **Pratima Chatterjee & Prasun Ghosal**

Department of Information Technology, Indian Institute of Engineering Science and Technology, Shibpur, Howrah

DOI: <https://doi.org/10.1007/s40031-023-00866-3>

Publication date: 06 March 2023

Pages: 461–473

Title: **Speech-Based Parkinson's Disease Prediction Using XGBoost-Based Features Selection and the Stacked Ensemble of Classifiers**

Author: **Biswajit Karan**

Department of Electronics and Communication Engineering, Aditya Engineering College(A), Surampalem, Andhra Pradesh

DOI: <https://doi.org/10.1007/s40031-022-00851-2>

Publication date: 16 January 2023

Pages: 475–483

Title: **Vehicle Type Detection and Classification Using Enhanced ReliefF Algorithm and Long Short-Term Memory Network**

Authors: **N Sathyanarayana & Anand M Narasimhamurthy**

Department of Electronics and Communication Engineering, Vemana Institute of Technology, Bengaluru;

- DOI: Department of Data Science, International School of Engineering (INSOFE), Bengaluru  
<https://doi.org/10.1007/s40031-022-00838-z>  
Publication date: 05 December 2022  
Pages: 485–499  
Title: **Verification of Period-Doubling Behavior of Ferroresonance Circuit with the Jacobian Matrix and Eigenvalues**  
Authors: **Rajat Shubhra Pal & Madhab Roy**  
Institute of Engineering and Management, Kolkata;  
Jadavpur University, Kolkata
- DOI: <https://doi.org/10.1007/s40031-022-00835-2>  
Publication date: 01 December 2022  
Pages: 501–510  
Title: **A Systematic Review of Research Dimensions Towards Dyslexia Screening Using Machine Learning**  
Authors: **Tabassum Gull Jan & Sajad Mohammad Khan**  
Department of Computer Science, University of Kashmir, Srinagar, J&K
- DOI: <https://doi.org/10.1007/s40031-023-00853-8>  
Publication date: 23 January 2023  
Pages: 511–522  
Title: **Development, Working and Standardization of Quantum Computing**  
Authors: **Arun Agarwal & Chandan Mohanta**  
Department of Electronics and Communication Engineering, ITER, Siksha 'O' Anusandhan  
Deemed to be University, Khandagiri, Bhubaneswar, Odisha
- DOI: <https://doi.org/10.1007/s40031-023-00868-1>  
Publication date: 21 February 2023  
Pages: 523–531  
Title: **Electrical Models for EV's Batteries: An Overview and Mathematical Design of RC Network**  
Authors: **Arvind S Pande, Bhanu Pratap Soni & Kishor V Bhadane**  
University of Engineering & Management Jaipur;  
Fiji National University, Suva, Fiji;  
Amrutvahini College of Engineering, Sangamner, Maharashtra
- DOI: <https://doi.org/10.1007/s40031-022-00852-1>  
Publication date: 30 January 2023  
Pages: 533–547

# Published Articles in IEI Journals

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## Journal of The Institution of Engineers (India): Series C

[Aerospace, Marine, Mechanical and Production Engineering]

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

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### Volume 104, Issue 2, April 2023

Title: **Assessment of Effectiveness Amount of Heat Absorption/Production and Magnetic Field on Entropy Generation During Conjugate Heat Transfer of Hybrid Nanofluid**

Authors: **Mohammad Nemati, Somayeh Davoodabadi Farahani & Hajar Mohamadzade Sani**

Faculty of Mechanical Engineering, Yazd University, Yazd, Iran;

School of Mechanical Engineering, Arak University of Technology, Arāk, Iran;

School of Mechanical Engineering, Iran University of Science and Technology, Tehran, Iran

DOI: <https://doi.org/10.1007/s40032-023-00921-4>

Publication date: 27 February 2023

Pages: 231–252

Title: **Design and Development of Smart Helmet**

Authors: **Sandip S Kanase, Shivagond N Teli, Sandhya D Jadhav, Jaydeep S Patil, Tanaji S Kanase & Ankur S Pawar**

Bharati Vidyapeeth College of Engineering, Navi Mumbai;

Bharati Vidhyapeeth's Jawaharlal Nehru Institute of Technology Polytechnic, Pune

DOI: <https://doi.org/10.1007/s40032-023-00918-z>

Publication date: 01 February 2023

Pages: 253–259

Title: **Experimental and Finite Element Analyses for High-Speed Machining of AISI 4340 Steel with ZTA Insert**

Authors: **Subhrojyoti Mazumder, Kunal Ghosh, Bipin Kumar Singh, Shitanshu Shekhar Chakraborty & Nilrudra Mandal**

Department of Mechanical Engineering, University of Malaya, 50603, Kuala Lumpur, Malaysia;

Academy of Scientific and Innovative Research (AcSIR), Ghaziabad;

Materials Processing and Microsystems Laboratory, CSIR-Central Mechanical Engineering

Research Institute, Durgapur, West Bengal;

Department of Mechanical Engineering, Sri Eshwar College of Engineering, Coimbatore, Tamil Nadu

DOI: <https://doi.org/10.1007/s40032-023-00917-0>

Publication date: 27 February 2023

Pages: 261–270

- Title: **Frequency Analysis of Variable Thickness Kirchhoff Plates by Isogeometric Approach**  
Authors: **Gourav Prasad Sinha & Bipin Kumar**  
Department of Mechanical Engineering, National Institute of Technology, Jamshedpur  
DOI: <https://doi.org/10.1007/s40032-023-00910-7>  
Publication date: 30 January 2023  
Pages: 271–280
- Title: **Influence of 2–10 wt% of SMA Nitinol Reinforcement on the Mechanical Properties of Glass–Epoxy Composites Manufactured Through the VARTM Process**  
Authors: **Tamilselvam Nallusamy, N Dhanush & S Kavya**  
Department of Aeronautical and Aerospace Engineering, MVJ College of Engineering (Autonomous), Bangalore, Karnataka  
DOI: <https://doi.org/10.1007/s40032-023-00913-4>  
Publication date: 30 January 2023  
Pages: 281–290
- Title: **On Dy<sup>+3</sup> Nobbled ZnO-Reinforced PVDF for Flexible Optical Sensor**  
Authors: **Ranvijay Kumar, Rupinder Singh, Vinay Kumar, Pawan Kumar & Nishant Ranjan**  
Department of Mechanical Engineering, University Center for Research and Development, Chandigarh University, Mohali, Punjab;  
Department of Mechanical Engineering, National Institute of Technical Teachers Training and Research, Chandigarh;  
Department of Physics, University Institute of Science, Chandigarh University, Mohali, Punjab  
DOI: <https://doi.org/10.1007/s40032-023-00920-5>  
Publication date: 27 February 2023  
Pages: 291–306
- Title: **Prediction of Anthropometric Dimensions Using Multiple Linear Regression and Artificial Neural Network Models**  
Authors: **Dinesh R Zanwar, Hitesh D Zanwar, Himanshu M Shukla & Ambarish A Deshpande**  
Department of Industrial Engineering, Ramdeobaba College of Engineering and Management, Nagpur, Maharashtra;  
Ramdeobaba College of Engineering and Management, Nagpur, Maharashtra;  
Department of Mechanical Engineering, Ramdeobaba College of Engineering and Management, Nagpur, Maharashtra  
DOI: <https://doi.org/10.1007/s40032-022-00904-x>  
Publication date: 20 January 2023  
Pages: 307–314
- Title: **Prediction of WEDM Performances Using Clustering Techniques in ANFIS During Machining of A286 Superalloy**  
Authors: **Subhankar Saha, Saikat Ranjan Maity & Sudip Dey**  
Department of Mechanical Engineering, National Institute of Technology, Silchar  
DOI: <https://doi.org/10.1007/s40032-023-00922-3>

# Published Articles in IEI Journals

Volume 8 | Issue 4 | April 2023

Publication date: 27 February 2023

Pages: 315–326

Title: **Quantitative Analysis of Energy Efficiency and Determination of Optimal Operating Mode for Marine Gas–Electric Hybrid Power System**

Authors: **Qidong Yang, Xiaojun Sun, Chong Yao, Zhijiang Liu & Enzhe Song**

Yantai Research Institute, Harbin Engineering University, Yantai, China;

College of Power and Energy Engineering, Harbin Engineering University, Harbin, China

DOI: <https://doi.org/10.1007/s40032-022-00889-7>

Publication date: 29 October 2022

Pages: 327–337

Title: **Research on Human Resource Allocation of Vulnerable Groups in Enterprises Based on a Resource Scheduling Algorithm**

Author: **Xi Chen**

School of Culture and Tourism, Wuxi Vocational College of Science and Technology, Wuxi City, 214000, Jiangsu Province, China

DOI: <https://doi.org/10.1007/s40032-023-00911-6>

Publication date: 19 January 2023

Pages: 339–344

Title: **Surface Roughness Modeling and Prediction Based on Vibration Signal Analysis and Machining Parameters in Milling of Aluminum by Artificial Neural Network**

Author: **Sabreen Abdallah Abdelwahab**

Production Technology Department, Faculty of Technology and Education, Helwan University, Cairo, 11732, Egypt

DOI: <https://doi.org/10.1007/s40032-023-00924-1>

Publication date: 09 February 2023

Pages: 345–375

Title: **Thermodynamic and Environmental Assessment of Low-GWP Alternative Refrigerants for Domestic Cooling**

Authors: **Md Amirul Islam, Tahmid Hasan Rupam, Shahadat Hosan & Bidyut Baran Saha**

Institute for Materials Chemistry and Engineering, Kyushu University, Kasuga-Koen 6-1, Kasuga-Shi, Fukuoka, 816-8580, Japan;

Department of Electrical and Electronics Engineering, Bangabandhu Sheikh Mujibur Rahman Science and Technology University, Gopalganj, 8100, Bangladesh;

International Institute for Carbon-Neutral Energy Research (WPI-I2CNER), Kyushu University, 744 Motooka, Nishi-Ku, Fukuoka, 819-0395, Japan;

Kyushu University Program for Leading Graduate School, Green Asia Education Center, Kyushu University, Fukuoka, Japan;

Department of Mechanical Engineering, Kyushu University, 744 Motooka, Nishi-Ku, Fukuoka, 819-0395, Japan

DOI: <https://doi.org/10.1007/s40032-023-00927-y>



Publication date: 28 February 2023

Pages: 377–383

Title: **Ultimate Strength Analysis of Plates with a Square Opening**

Authors: **Ahmad Rahbar Ranji & Shahpour Alirezaee**

Department of Maritime Engineering, Amirkabir University of Technology, Tehran, Iran;  
Department of Mechanical, Automotive and Material Engineering, University of Windsor,  
Windsor, Canada

DOI: <https://doi.org/10.1007/s40032-022-00890-0>

Publication date: 28 October 2022

Pages: 385–392

Title: **Vibration Analysis of the Base Structure Supporting a Centrifuge–Motor Assembly in a Petroleum Oil Refinery**

Authors: **Ashwin Kumar Devaraj & Raviraja Adhikari**

Department of Mechanical and Industrial Engineering, Manipal Institute of Technology, Manipal  
Academy of Higher Education, Manipal, Karnataka

DOI: <https://doi.org/10.1007/s40032-023-00919-y>

Publication date: 24 February 2023

Pages: 393–401

Title: **Human-Centered Design (HCD) of Rural Cooking Stove**

Authors: **M Arunachalam & Dev Kirankumar Patel**

Department of Industrial Design, Karnavati University, Gandhinagar;  
IraA Fulton Schools of Engineering and the College of Integrative Sciences and Arts, Arizona  
State University, Arizona, USA

DOI: <https://doi.org/10.1007/s40032-023-00914-3>

Publication date: 03 March 2023

Pages: 403–417

Title: **Influence of Nano-Clay and Strain Rate on the In-Plane Compression Response of Nano-Clay/AA3003 Honeycomb Sandwich Panels**

Authors: **P V Prasanth, M Edwin Sahaya Raj, R S Jayaram & S Senthil Murugan**

Department of Mechanical Engineering, Noorul Islam Centre for Higher Education, Kumarakoil,  
Tamilnadu;  
Department of Automobile Engineering, Noorul Islam Centre for Higher Education, Kumarakoil,  
Tamilnadu;  
Department of Mechanical Engineering, Amrita College of Engineering and Technology,  
Erachakulam, Tamilnadu;  
Department of Mechanical Engineering, Rajalakshmi Engineering College, Chennai,  
Tamilnadu

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Publication date: 28 October 2022

Pages: 419–422

# Published Articles in IEI Journals

Volume 8 | Issue 4 | April 2023

- Title: **A Review on Vibrations in Electric and Hybrid Electric Vehicles**  
Authors: **Keerthan Krishna, G T Mahesha, Sriharsha Hegde & B Satish Shenoy**  
Department of Aeronautical and Automobile Engineering, Manipal Institute of Technology,  
Manipal Academy of Higher Education, Manipal  
DOI: <https://doi.org/10.1007/s40032-023-00930-3>  
Publication date: 20 February 2023  
Pages: 423–438
- Title: **Feeding Mechanisms in the Auto-Body Stamping Production Line: A Review of Common Research**  
Author: **Luchuan Yu**  
College of Mechanical and Electrical Engineering, Wenzhou University, Wenzhou, 325035,  
People's Republic of China  
DOI: <https://doi.org/10.1007/s40032-023-00925-0>  
Publication date: 01 February 2023  
Pages: 439–448
- Title: **Creating Value for Reliability Centered Maintenance (RCM) in Ship Machinery Maintenance from BIG Data and Artificial Intelligence**  
Author: **Ulhas S Kalghatgi**  
Navi Mumbai, Maharashtra  
DOI: <https://doi.org/10.1007/s40032-022-00900-1>  
Publication date: 28 October 2022  
Pages: 449–453
- Title: **Transient Deformation of an Anisotropic Cylindrical Shell with Structural Features**  
Authors: **Natalia A Lokteva, Dmitry O Serdyuk & Pavel D Skopintsev**  
Moscow Aviation Institute (National Research University), 4, Volokolamsk Highway, Moscow,  
Russian Federation, 125993;  
Lomonosov Research Institute of Mechanics, 1, Michurinsky Prospekt, Moscow, Russian  
Federation, 119192  
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Publication date: 24 February 2023  
Pages: 455–466

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Volume 8 | Issue 4 | April 2023

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Sl. No.	Name of the Course	Scheduled Dates
1.	Climate Change Impact on Water Resources, its Imitation and Adaptation	01 - 04 May 23
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7.	Smart meter Integration - PMU Asset Management in T&D Utilities	09 - 12 May 23
8.	Conducting EIA Study and Preparation of EIA Reports - Case Study & Group Discussion.	10 - 12 May 23
9.	Conflict Management, Decision Making and Problem-Solving Skills	10 - 12 May 23
10.	Surface Engineering - Concepts, Applications and Emerging Technologies	15 - 17 May 23
11.	Nature based Solutions for Sustainable Development	16 - 18 May 23
12.	Best Practices in O&M of Coal Mills & Feeders	17 - 19 May 23
13.	Planning Design and Construction of Advanced Underground Subway	22 - 26 May 23
14.	Reverse Engineering Techniques (Collaboration with Industry)	22 - 24 May 23
15.	Network & Security Administration	22 - 26 May 23
16.	Interpersonal Effectiveness and Transcendental Intelligence for Innovative Leadership	22 - 24 May 23
17.	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	22 - 26 May 23
18.	Renewable Energy Systems - Wind & Solar - Grid Integration (Online)	22 - 26 May 23
19.	Leadership Excellence: An Innovative Approach	22 - 24 May 23
20.	Convergence for Synergy: One day workshop on SDG Goal 13 - Climate Action	23 May 23
21.	Assessment of Irrigation Demand and Irrigation Scheduling using Latest Software Applications	23 - 25 May 23
22.	Sustainable Urban Drainage System	24 - 26 May 23