

IEI EPITOME

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A Century of Service to the Nation

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Announcements

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Notification for R&D Grant-in-Aid

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, 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.

Members in the News



Mr Vipin Kumar Sharma, MIE

Additional Superintendent (Mill & Safety)

Department of Atomic Energy, Uranium Corporation of India Limited, Government of India (E), Kadapa, Andhra Pradesh

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He received prestigious **ITAP Awards 2022** for creativity and success in the field of **Best Chemical Engineering Teacher of the Year Award** by **Raja Ratna Group** in presence of several reputed dignitaries at KITS Engineering College, East Godavari District of Andhra Pradesh on 02 October 2022.



37th Indian Engineering Congress

December 16-18, 2022

Theme:



Role of Engineers for Creating a Sustainable & Self-Reliant India

REGISTRATION DETAILS

Who will Attend

- Engineers from all sectors – state and central government, public enterprises, industries & services;
- Academia – Student, Faculty and Management;
- Researchers, Scientists and Engineers, Defense, Aerospace, Industrial & from R&D establishment;
- International participation;
- Members related to Engineering Profession.

Registration Fees

Description	Before 10 November 2022		From 10 November 2022	
	Without GST (Rs)	With GST (Rs)	Without GST (Rs)	With GST (Rs)
Corporate Members	4000/-	4720/-	4500/-	5310/-
Non-Corporate Members	5000/-	5900/-	5500/-	6490/-
Spouses of Participants	2000/-	2360/-	2500/-	2950/-
ST/T* Members/Students**	1500/-	1770/-	2000/-	2360/-
International Delegates	\$600		\$700	

*Attested copy of Identity card to be enclosed with the registration form

Payment Details

All payment by registered participants, collaborators, sponsors, advertisement providers, exhibition stall should be remitted in the form of Demand Draft / Cheque in favour of "The Institution of Engineers (India) Tamilnadu State Centre". The Bank details is given below.

Beneficiary Name : The Institution of Engineers (India), Tamilnadu State Centre
 Account Number : 0346000100049405
 Name of the Bank : Punjab National Bank
 IFSC Code : PUNB0034600
 GST No. : 33AAATT3439Q1Z1

*The payment receipt to be enclosed with the Registration Form.

For more details, please visit <https://37iec.org/registration-details/>

The Registration Form along with DD shall be sent to the following address.

THE ORGANISING CHAIRMAN

37th IEC 2022

The Institution of Engineers (India)

Tamilnadu State Centre,

No. 19, Swami Sivananda Salai, Chepauk, Chennai 600 005

Phone: 044-25360614 / 9962950333 | e-mail: 37iecchennai@gmail.com, info@37iec.org | website: <http://www.37iec.org>

Publication by Members

Book



Prof (Dr) Sujay Kumar Dutta, MIE

Retired

M S University of Baroda, Vadodara, Gujarat

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FUNDAMENTAL OF TRANSPORT PHENOMENA AND METALLURGICAL PROCESS MODELING

This textbook presents the fundamental of transport phenomena and metallurgical process modeling in easy-to-understand format. It covers all the important and basic concepts, derivations and numerical problems for the undergraduate and graduate engineering students. It includes topics such as fluid dynamics, mass and momentum balances, mass transfer, basic concepts of models and applications. This textbook can also be used as a reference book by engineers, professionals and research scientists to gain better understanding on mass and heat balances. Given the contents, this textbook will be highly useful for the core course of transport phenomena in metallurgical processes for graduate and advanced graduate students in various engineering disciplines. This textbook will also serve as a refresher course for advanced graduate students who are engaged in research related to transport phenomena and metallurgical processes.

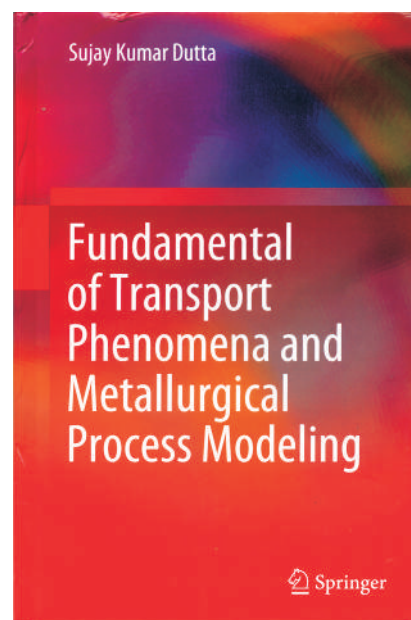
Hardcover ISBN 978-981-19-2155-1

eBook ISBN 978-981-19-2156-8

Edition Number 1

Number of Pages XV, 337

Publisher Springer Singapore



37th Indian Engineering Congress

December 16-18, 2022

Theme:



Role of Engineers for Creating a Sustainable & Self-Reliant India

EXHIBITION

An exhibition is being organized to provide ample opportunity to show case your products to your stakeholders at congress premises.

For more details, please visit <https://37iec.org/registration-details/>

Application sent to the following address

CONGRESS SECRETARIAT

37th Indian Engineering Congress

The Institution of Engineers (India)

Tamilnadu State Centre

No. 19, Swami Sivananda Salai, Chepauk, Chennai 600 005.

Phone: 044-25360614 / 9962950333 | E-mail: 37iecchennai@gmail.com, info@37iec.org | Website: <https://www.37iec.org>

Publication by Members

Book Chapter



Dr Raj Kumar Goswami, FIE

Professor and Principal

Gayatri Vidya Parishad College of Engineering for Women, Visakhapatnam, Andhra Pradesh

✉ rajkumargoswami@gmail.com

Book Chapter: Investigations on Convolutional Neural Network in Classification of the Chest X-Ray Images for COVID-19 and Pneumonia

Chapter 9, Artificial Intelligence Applications for Health Care, CRC Press, Taylor & Francis Group, LLC, 2022, pp 163-180, ISBN (hbk): 978-1-032-14846-5; ISBN (pbk): 978-1-032-14847-2; ISBN (ebk): 978-1-003-24140-9

DOI: [10.1201/9781003241409-9](https://doi.org/10.1201/9781003241409-9)

Co-authors: Ganesh Laveti and P Chaya Devi

Abstract: According to the statistics from situation report-92 of the World Health Organization (WHO), deaths due to COVID-19 are increasing at a rapid rate globally. Hence, methods of early detection, treatment, and isolation of COVID-19 patients have become a top priority in the prevailing medical situations. In line, a lot of research is progressing in the field of machine learning on radiography imaging for detection and diagnosis of tumours, bone fractures, abnormality in lungs and heart, etc. In view of the variation in isolation and medication procedures, it is essential to clearly classify regular pneumonia and COVID-19 pneumonia. But the high degree correlation in their clinical features is the major challenge and is the considered classification problem. In this chapter, we investigate the possibilities in providing a solution to the classification problem, with deep learning Convolution Neural Network (CNN). To progress with the work, we identified CNN architectures that showed significant contributions to image classification problems and re-evaluated them with the best architecture parameters and with the new COVID-19 database. The work in this chapter progresses in two stages. Stage one focuses on identifying the optimal optimization algorithm for CNN, out of Stochastic Gradient Descent Momentum (SGDM), Root Mean Square Propagation (RMSProp), and Adaptive Momentum estimation (ADAM). Whereas stage two works on the implementation of pre-trained CNN ResNet50 with transfer learning, to solve the COVID-19 classification problem. The classification problem has three output classes: non-infected (normal), pneumonia, and COVID-19. This work uses in its training and testing of CNN a COVIDx chest X-ray image database with images collected from three open to public data repositories. The analysis of performance accuracy based on the confusion matrix (conf-mat) given at both stages is done using two-fold cross-validation with 30 iteration frequency. Considering the preliminary results obtained in stage 1, we confirm that SGDM is an optimal algorithm for CNN to solve the classification problem. The results obtained in stage 2 show that ResNet50 with SGDM is a sub-optimal algorithm with base class accuracy of 95.3%, subclass accuracy of 95.43% (pneumonia detection), and has correctly identified 13 cases out of 19 COVID-19 cases.



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Theme:



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<https://37iec.org/sponsorships-and-advertisement-details/#sponsorshipopportunities>

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Mr S Kannan, Chairman
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Dr T M Gunaraja, Organising Chairman
Ph : 94440 26120

Mr R Ramdos, Organising Secretary
Ph : 94440 19091

Publication by Members

Papers published in the Journals / Proceedings



Mr M Penchala Reddy, MIE

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Title of Paper: **Computational Study on Combustion Characteristics of Various Samples of Pulverized Coal in a Dual Swirl Co-and Counter Combustor**

International Journal of Scientific & Engineering Research (IJSER), 2022, 13(7), pp 71-91, ISSN: 2229-5518

URL: https://www.ijser.org/researchpaper/Computational_Study_on_Combustion_Characteristics_of_Various_Samples_of_Pulverized_Coal_in_a_Dual_Swirl_Co_and_Counter_Combustor.pdf

Co-author: Hemachandra Reddy

Abstract: Pulverized coal combustion is the primary method of generating thermal power in India. The combustion of pulverized coal is carried out in large furnaces. Improvement in the design and performances of these furnaces and detailed picture of its behaviors at different operating conditions can be efficiently assisted using computational fluid dynamics modeling. In the present work, we investigate the combustion and emissions characteristics of high-grade foreign and low-grade Indian coals using a dual swirl assisted (counter swirl configuration) pulverized coal combustion burner modeled with CFD. In addition, flame characteristics, flow patterns, and CO emissions are extensively discussed. Results indicate that low-grade Indian coals with high ash and moisture, IS2 and IS3, perform less well than high-grade foreign coals, IAS1 and SA1. As a result, low-grade Indian coals with high ash and moisture content will need a strong swirl and longer combustion chamber. As far as CO emissions are concerned, Indonesian coal IAS1 and Indian coal IS1 rank higher than the other coals. However, IS3 from India has the overall worst CO emission performance.

Keywords: Swirl Combustion, Devolatilization, Moisture, Ash, Recirculation



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Title of Paper: **A Variant Binary Classification Model for No-DR Mild-DR Detection using CLAHE Images with Transfer Learning**

IEEE Explore, 1(1), 2022, Print on Demand (PoD) ISBN:978-1-6654-6884-8, Electronic ISBN:978-1-6654-6883-1

DOI: [10.1109/IC3SIS54991.2022.9885665](https://doi.org/10.1109/IC3SIS54991.2022.9885665)

Co-author: P Ranjana

Abstract: Different types of deep learning models exist for medical image analysis and disease prediction. The use of a convolution Neural Network (CNN) that is pre-trained with sufficient fine-tuning is an efficient method in the medical image analysis. The method called transfer-learning (TL) helps to achieve fine-tuning in pre-trained CNN models, which reduces the cost of training from scratch. In this work, we concentrated to detect Diabetic Retinopathy (DR), which is an eye complication because of the poor control in blood sugar levels. We used VGG19, a pre-trained CNN model that acts as a base model of No-DR mild DR detection, and performed some kind of fine-tuning to detect the presence of DR in its early stage. We trained our model using the RGB images data set that is preprocessed using CLAHE algorithm and provided a performance comparison in terms of accuracy. The datasets are downloaded from Kaggle, an open-source platform, which provides different class images based on severity. The model gave accuracy of 93.89% in 20 epochs and a 90%F1 score.

Keywords: CLAHE, Deep Learning, Diabetic Retinopathy, Fine Tuning, Transfer Learning, VGG19

Publication by Members



Mr Devjit Acharjee, AMIE

Assistant Engineer

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Title of Paper: Numerical Study of the Effect of Shear Connectors in Insulated Sandwich Panel Building System

Aerospace and Associated Technology, CRC Press, Chapter 50, Taylor & Francis Group, 2022, eBook ISBN: 9781003324539

DOI: <https://doi.org/10.1201/9781003324539-50>

Co-authors: Dibya Jyoti Basu and Debasish Bandyopadhyay

Abstract: Expanded polystyrene sandwich (EPS) panels are one of the most advanced building systems currently accessible as an alternate solution for India's urgently needed affordable housing. The structural stability of these structures, on the other hand, is significantly dependent on these shear connectors' proper operation. The proposed paper looked into the effect of spacing and alternative scenarios of shear connector failures, as well as the degradation of the bond between concrete and polystyrene core in EPS panels under flexure. It is also attempted to perform a parametric study of the wall panel thickness, reinforcement spacing, and grade of steel. It is observed that the structural stability of EPS panels depends on the spacing, diameter and adequacies of the shear connectors. It seems that the insulated precast building panel structural system has a great potential for practical implementation to achieve the goal of efficient affordable housing.

Title of Paper: Numerical Study of Tilted Multi-storied RCC Buildings on Shallow Foundations Considering Soil-structure Interaction

Aerospace and Associated Technology, CRC Press, Chapter 51, Taylor & Francis Group, 2022, eBook ISBN: 9781003324539

DOI: <https://doi.org/10.1201/9781003324539-51>

Co-authors: Srijani Bandyopadhyay and Debasish Bandyopadhyay

Abstract: Tilt and settlement of mid-rise RCC buildings with shallow foundations in alluvial soil has become a common problem, greatly affecting the structural stability; thus demands accurate investigation. Tilt monitoring to assess the verticality and non-destructive tests to assess strength and quality of concrete are practiced in real life situation, which cannot infer the overall building stability. Numerical modelling with fixed supports may address the stability issue to some extent, but the soil-structure interaction seems to contribute to a great extent on the stability of the tilted buildings; mainly on softer soil. Numerical study of building models on finite element platform considering different foundation and soil types, nature and extent of tilts, building configurations have been made in the present paper. It is found that soil type, soil-structure interaction, building configuration, amount and type of tilt have significant role on the stability of tilted buildings. The present study may be explored for safety evaluation and retrofit of existing multi-storied tilted buildings.



IEI-Springer Journal



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ISSN Electronic 2250-2157

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ISSN Electronic 2250-2114

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Published Articles in IEI Journals



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

Electrical, Electronics & Telecommunication and Computer Engineering

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

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Volume 103, Issue 5, October 2022

- Title:** **A Deep Learning Framework with Cross Pooled Soft Attention for Facial Expression Recognition**
- Authors :** **Jyostna Devi Bodapati, D S Bhupal Naik & B Suvarna**
 Department of Computer Science and Engineering, Vignan's Foundation for Science Technology and Research, Vadlamudi, India
Veeranjaneyulu Naralasetti
 Department of Information Technology, Vignan's Foundation for Science Technology and Research, Vadlamudi, India
- DOI:** <https://doi.org/10.1007/s40031-022-00746-2>
- Publication Date:** 04 May 2022
- Pages:** 1395–1405
- Title:** **A Faulty Line Detection Technique for Series Compensated Line using Synchrophasor Data**
- Authors :** **A V Koteswara Rao, K M Soni & Sanjay Kumar Sinha**
 Amity School of Engineering and Technology, Amity University, Uttar Pradesh, Noida, India
Ibraheem Nasiruddin
 Department of Electrical Engineering, Jamia Millia Islamia University, Jamia Nagar, Delhi, India
- DOI:** <https://doi.org/10.1007/s40031-022-00736-4>
- Publication Date:** 16 May 2022
- Pages:** 1407–1413
- Title:** **A Multi-objective Generalized Teacher-Learning-Based-Optimization Algorithm**
- Authors :** **Satya Deo Kumar Ram, Shashank Srivastava & K K Mishra**
 Computer Science & Engineering Department, National Institute of Technology, Allahabad, Prayagraj, India
- DOI:** <https://doi.org/10.1007/s40031-022-00731-9>
- Publication Date:** 10 May 2022
- Pages:** 1415–1430
- Title:** **A Novelty Analysis about an Impact of Tweets and Twitter Bios on Topic Quality Discovery using the Topic Modeling**
- Authors :** **Rathinasamy Muthusami**
 Department of Computer Applications, Dr Mahalingam College of Engineering and Technology, Coimbatore, Tamil Nadu, India
Kandhasamy Saritha
 Department of Mathematics, P A College of Engineering and Technology, Coimbatore, Tamil Nadu, India
- DOI:** <https://doi.org/10.1007/s40031-022-00776-w>

Published Articles in IEI Journals

Publication Date: 20 July 2022

Pages: 1431–1441

Title: **A Novel Approach for Detecting SQL Injection Attacks Using Snort**

Authors : **Alka Gupta & Lalit Sen Sharma**

Department of Computer Science and IT, University of Jammu, Jammu, India

DOI: <https://doi.org/10.1007/s40031-022-00749-z>

Publication Date: 22 May 2022

Pages: 1443–1451

Title: **Compact Capacitor-Loaded Tunable Microstrip Bandpass Filter for Low-Frequency Applications**

Author : **Punithavathi Duraiswamy**

Department of Electronics and Communication Engineering, M.S Ramaiah University of Applied Sciences, Bengaluru, India

DOI: <https://doi.org/10.1007/s40031-022-00763-1>

Publication Date: 19 July 2022

Pages: 1453–1457

Title: **Deep Learning-Based Trend Analysis on Indian Stock Market in COVID-19 Pandemic Scenario and Forecasting Future Financial Drift**

Authors : **Janmenjoy Nayak**

Department of Computer Science, Maharaja Sriram Chandra BhanjaDeo University, Baripada, Mayurbhanj, Odisha, India

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Department of Information & Communication Technology, Fakir Mohan University, Balasore, Odisha, India

DOI: <https://doi.org/10.1007/s40031-022-00762-2>

Publication Date: 04 July 2022

Pages: 1459–1478

Title: **Design and Area Performance Energy Consumption Comparison of Secured Network-on-Chip with PTP and Bus Interconnections**

Authors : **Jayshree & Debadatta Pati**

Department of Electronics and Communication Engineering, National Institute of Technology Nagaland, Dimapur, Nagaland, India

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Department of Electronics and Communication Engineering, Indian Institute of Information Technology Tiruchirappalli, Tiruchirappalli, Tamil Nadu, 620015, India

DOI: <https://doi.org/10.1007/s40031-022-00735-5>

Published Articles in IEI Journals

Publication Date: 30 May 2022

Pages: 1479–1491

Title: **Design and Magnetic Field Simulation Analysis of Radial Gap Adjustable Magneto Rheological Valve**

Authors : **Liyu Chen, Qinghui Liu & Ru Zhang**

School of Mathematics and Computational Science, Tangshan Normal University, Tangshan, 063000, People's Republic of China

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DOI: <https://doi.org/10.1007/s40031-022-00772-0>

Publication Date: 25 July 2022

Pages: 1493–1503

Title: **Design an Optimal ANFIS Controller using Bee Colony Optimization for Trajectory Tracking of a Quadrotor UAV**

Authors : **Boumediene Selma & Samira Chouraqui**

Département d'Informatique, Université Des Sciences Et de La Technologie d'Oran USTO'MB, 31000, Oran, Algérie

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DOI: <https://doi.org/10.1007/s40031-022-00747-1>

Publication Date: 11 July 2022

Pages: 1505–1519

Title: **Design and Performance Analysis of Grid-Connected Solar Photovoltaic System with Performance Forecasting Approach (PFA)**

Authors : **Akshay Narendra Deshmukh & Vinod K Chandrakar**

G H Raison College of Engineering, Nagpur, Maharashtra, India

DOI: <https://doi.org/10.1007/s40031-022-00779-7>

Publication Date: 16 August 2022

Pages: 1521–1532

Title: **Design of PV System based on 3-Degree of Freedom Fractional Order Tilt-Integral-Derivative Controller with Filter**

Authors : **Akshaya Kumar Patra**

Department of Electrical and Electronics Engineering, ITER, Siksha 'O'Anusandhan University, Bhubaneswar, Odisha, India

Debswarup Rath

Department of Electrical Engineering, ITER, Siksha 'O'Anusandhan University, Bhubaneswar, Odisha, India

Published Articles in IEI Journals

DOI: <https://doi.org/10.1007/s40031-022-00739-1>

Publication Date: 25 April 2022

Pages: 1533–1548

Title: **Design, Simulation and Analysis of a Novel EBG Structure using Advanced Design System: Implementation and Related Issues**

Authors : **Y Uma Maheswari & A Amudha**

Department of Electrical and Electronics Engineering, Karpagam Academy of Higher Education, Coimbatore, India

DOI: <https://doi.org/10.1007/s40031-022-00758-y>

Publication Date: 03 June 2022

Pages: 1549–1554

Title: **Development of ANN and ANFIS Classifier for Betel Leaf Pathogen Detection**

Authors : **Amar Kumar Dey, Manisha Sharma & M R Meshram**

Bhilai Institute of Technology, Durg, Durg, India

DOI: <https://doi.org/10.1007/s40031-022-00743-5>

Publication Date: 29 April 2022

Pages: 1555–1562

Title: **Free of Cost Energy Conservation through Behavioural Training: an Indian Perspective**

Authors : **Shaikh Shamser Ali**

Energy Conservation Project Management, Freelancing, Chennai, India

Ruchi Tyagi

University of Petroleum and Energy Studies, Dehradun, India

DOI: <https://doi.org/10.1007/s40031-022-00768-w>

Publication Date: 27 July 2022

Pages: 1563–1575

Title: **Grid-Connected DFIG Driven Wind System for Low Voltage Ride Through Enhancement using Neural Predictive Controller**

Authors : **Ravikiran Hiremath & Tukaram Moger**

National Institute of Technology Karnataka, Surathkal, Mangalore, Karnataka, India

DOI: <https://doi.org/10.1007/s40031-022-00761-3>

Publication Date: 19 July 2022

Pages: 1577–1588

Title: **Histopathology Breast Cancer Detection and Classification using Optimized Superpixel Clustering Algorithm and Support Vector Machine**

Authors : **Rajesh Saturi & Prem Chand Parvataneni**

Department of Computer Science Engineering, University College of Engineering, Osmania University, Hyderabad, India

DOI: <https://doi.org/10.1007/s40031-022-00745-3>

Publication Date: 09 May 2022

Pages: 1589–1603

Title: **Lookup Table based Switching selection for Direct Torque Controlled Multi-phase Asynchronous Machine Drive**

Authors : **Ajit Nandawadekar**

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Published Articles in IEI Journals

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K K Nipin

Dr D Y Patil Institute of Technology, Pune, India

DOI: <https://doi.org/10.1007/s40031-022-00732-8>

Publication Date: 13 May 2022

Pages: 1605–1618

Title: **M. Masi Entropy- and Grey Wolf Optimizer-Based Multilevel Thresholding Approach for Image Segmentation**

Authors : **Baljit Singh Khehra**

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Arjan Singh

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Department of Computer Science and Engineering, Baba Banda Singh Bahadur Engineering College, Fatehgarh Sahib, Punjab, India

DOI: <https://doi.org/10.1007/s40031-022-00740-8>

Publication Date: 27 April 2022

Pages: 1619–1642

Title: **Multi-Objective Optimal Power Flow with efficient Constraint Handling using Hybrid Decomposition and Local Dominance Method**

Authors : **Ravi Kumar Avvari & D M Vinod Kumar**

Department of Electrical Engineering, National Institute of Technology Warangal, Warangal, Telangana, India

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Institute of Equipment Engineering, Shenyang Ligong University, Liaoning Shenyang, 110159, China

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