

Lecture Notes in Networks and Systems 494

Vikrant Bhateja
K. V. N. Sunitha
Yen-Wei Chen
Yu-Dong Zhang *Editors*

Intelligent System Design

Proceedings of INDIA 2022

 Springer

Lecture Notes in Networks and Systems

Volume 494

Series Editor

Janusz Kacprzyk, Systems Research Institute, Polish Academy of Sciences,
Warsaw, Poland

Advisory Editors

Fernando Gomide, Department of Computer Engineering and Automation—DCA,
School of Electrical and Computer Engineering—FEEC, University of
Campinas—UNICAMP, São Paulo, Brazil

Okyay Kaynak, Department of Electrical and Electronic Engineering,
Bogazici University, Istanbul, Turkey

Derong Liu, Department of Electrical and Computer Engineering, University of
Illinois at Chicago, Chicago, USA

Institute of Automation, Chinese Academy of Sciences, Beijing, China

Witold Pedrycz, Department of Electrical and Computer Engineering, University of
Alberta, Alberta, Canada

Systems Research Institute, Polish Academy of Sciences, Warsaw, Poland

Marios M. Polycarpou, Department of Electrical and Computer Engineering,
KIOS Research Center for Intelligent Systems and Networks, University of Cyprus,
Nicosia, Cyprus

Imre J. Rudas, Óbuda University, Budapest, Hungary

Jun Wang, Department of Computer Science, City University of Hong Kong,
Kowloon, Hong Kong

The series “Lecture Notes in Networks and Systems” publishes the latest developments in Networks and Systems—quickly, informally and with high quality. Original research reported in proceedings and post-proceedings represents the core of LNNS.

Volumes published in LNNS embrace all aspects and subfields of, as well as new challenges in, Networks and Systems.

The series contains proceedings and edited volumes in systems and networks, spanning the areas of Cyber-Physical Systems, Autonomous Systems, Sensor Networks, Control Systems, Energy Systems, Automotive Systems, Biological Systems, Vehicular Networking and Connected Vehicles, Aerospace Systems, Automation, Manufacturing, Smart Grids, Nonlinear Systems, Power Systems, Robotics, Social Systems, Economic Systems and other. Of particular value to both the contributors and the readership are the short publication timeframe and the world-wide distribution and exposure which enable both a wide and rapid dissemination of research output.

The series covers the theory, applications, and perspectives on the state of the art and future developments relevant to systems and networks, decision making, control, complex processes and related areas, as embedded in the fields of interdisciplinary and applied sciences, engineering, computer science, physics, economics, social, and life sciences, as well as the paradigms and methodologies behind them.

Indexed by SCOPUS, INSPEC, WTI Frankfurt eG, zbMATH, SCImago.

All books published in the series are submitted for consideration in Web of Science.

For proposals from Asia please contact Aninda Bose (aninda.bose@springer.com).

Vikrant Bhateja · K. V. N. Sunitha · Yen-Wei Chen ·
Yu-Dong Zhang
Editors

Intelligent System Design

Proceedings of INDIA 2022

 Springer

Editors

Vikrant Bhateja
Department of Electronics
and Communication Engineering
Shri Ramswaroop Memorial College
of Engineering and Management
(SRMCEM)
Dr. A. P. J. Abdul Kalam Technical
University
Lucknow, Uttar Pradesh, India

K. V. N. Sunitha
College of Engineering for Women
BVRIT Hyderabad
Hyderabad, Telangana, India

Yu-Dong Zhang
Department of Informatics
University of Leicester
Leicester, UK

Yen-Wei Chen
College of Information Science
and Engineering
Ritsumeikan University
Kusuatsu, Shiga, Japan

ISSN 2367-3370

ISSN 2367-3389 (electronic)

Lecture Notes in Networks and Systems

ISBN 978-981-19-4862-6

ISBN 978-981-19-4863-3 (eBook)

<https://doi.org/10.1007/978-981-19-4863-3>

© The Editor(s) (if applicable) and The Author(s), under exclusive license to Springer Nature Singapore Pte Ltd. 2023

This work is subject to copyright. All rights are solely and exclusively licensed by the Publisher, whether the whole or part of the material is concerned, specifically the rights of translation, reprinting, reuse of illustrations, recitation, broadcasting, reproduction on microfilms or in any other physical way, and transmission or information storage and retrieval, electronic adaptation, computer software, or by similar or dissimilar methodology now known or hereafter developed.

The use of general descriptive names, registered names, trademarks, service marks, etc. in this publication does not imply, even in the absence of a specific statement, that such names are exempt from the relevant protective laws and regulations and therefore free for general use.

The publisher, the authors, and the editors are safe to assume that the advice and information in this book are believed to be true and accurate at the date of publication. Neither the publisher nor the authors or the editors give a warranty, expressed or implied, with respect to the material contained herein or for any errors or omissions that may have been made. The publisher remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

This Springer imprint is published by the registered company Springer Nature Singapore Pte Ltd. The registered company address is: 152 Beach Road, #21-01/04 Gateway East, Singapore 189721, Singapore

Conference Organization Committees

Chief Patron

Sri. K. V. Vishnu Raju, Chairman, SVES

Patrons

Sri. Ravichandran Rajagopal, Vice-Chairman, SVES

Sri K. Aditya Vissam, Secretary, SVES

Conference Chairs

Dr. K. V. N. Sunitha, Principal, BVRIT, Hyderabad, India

Dr. Suresh Chandra Satapathy, KIIT, Bhubaneswar, Odisha, India

Organizing Chair

Dr. J. Naga Vishnu Vardhan, Professor, ECE, and Professor-Incharge Academics, BVRIT, Hyderabad, India

Publication Chair

Dr. Vikrant Bhateja, Shri Ramswaroop Memorial College of Engineering and Management, Lucknow, Uttar Pradesh, India

Organizing Committee

Dr. Ch. Sunil Kumar, Vice-Principal and HoD, EEE
Dr. K. Srinivasa Reddy, HoD, CSE
Dr. S. L. Aruna Rao, HoD, IT
Dr. Anwar Bhasha Pattan, HoD, ECE
Dr. L. Lakshmi, HoD, CSE (AI&ML)
Dr. M. Anita, HoD, BSH
Prof. Murali Nath, Prof. Incharge, Accreditations
Dr. G. Naga Satish, Professor, CSE
Dr. K. Adinarayana Reddy, Professor, IT
Dr. J. Manoj Kumar, Prof. Incharge, Admissions
Ms. M. Praveena, Associate Professor, ECE
Mr. R. Guruswamy, Associate Professor, EEE

Website and Poster Committee

Ms. M. Shanmuga Sundari, Assistant Professor, CSE
Ch. Anil Kumar, Assistant Professor, IT
Mr. R. Priyakanth, Associate Professor, ECE

Publicity Committee

Dr. P. Kayal, Associate Professor, IT and R&D Incharge
Dr. V. Rajeswari, Professor, EEE
Dr. M. Parvathi, Professor, ECE
Dr. V. Madhavi, Associate Professor, BSH
Dr. M. Indrasena Reddy, Associate Professor, CSE
Dr. P. Anji Reddy Polu, Assistant Professor, BSH
Dr. A. Sudharshan Chakravarthy, Assistant Professor, CSE

Advisory Committee

Aimé Lay-Ekuakille, University of Salento, Lecce, Italy
Amira Ashour, Tanta University, Egypt
Aynur Unal, Stanford University, USA
Bansidhar Majhi, IIIT Kancheepuram, Tamil Nadu, India
Dilip Kumar Sharma, Vice-Chairman, IEEE, U.P. Section

Yu-Dong Zhang, University of Leicester, UK
 Ganpati Panda, IIT Bhubaneswar, Odisha, India
 Govardhan, Professor in CSE and Rector, JNTUH, Hyderabad, India
 Wenxian Yang, Senior Lecturer, University of Newcastle
 Jagdish Chand Bansal, South Asian University, New Delhi, India
 Muruganandam, Lecturer, Department of Engineering (Electrical Engineering Section), University of Technology and Applied Sciences—Ibri, Sultanate of Oman
 João Manuel R. S. Tavares, Universidade do Porto (FEUP), Porto, Portugal
 Jyotsana Kumar Mandal, University of Kalyani, West Bengal, India
 K. C. Santosh, University of South Dakota, USA
 Le Hoang Son, Vietnam National University, Hanoi, Vietnam
 Naeem Hanoon, Multimedia University, Cyberjaya, Malaysia
 V. Vijaya Kumar, Dean, Department of CSE and IT, Anurag University, Hyderabad, India
 Nilanjan Dey, JIS University, Kolkata, India
 Noor Zaman, Universiti Teknologi, PETRONAS, Malaysia
 Roman Senkerik, Tomas Bata University, Zlin, Czech Republic
 C. Krishana Mohan, Professor, CSE, IIT Hyderabad, India
 P. Radha Krishna, Professor, CSE, NIT Warangal, India
 Swagatam Das, Indian Statistical Institute, Kolkata, India
 Vijayalakshmi Saravanan, University of South Dakota, Department of Computer Science, Buffalo, New York, USA
 Thanikanti Sudhakar Babu, Post Doctoral Fellow Institute of Power Engineering, Department of Electrical Power Engineering, Universiti Tenaga Nasional (UNITEN), Malaysia
 Siba K. Udgata, University of Hyderabad, Telangana, India
 K. M. Prasad, Senior R&D Engineer, Enginia Research Inc. Winnipeg, Canada
 Meenalosini Vimal Cruz, Assistant Professor, Computer Science, Georgia Southern University, Port Wentworth, Georgia, USA
 Shri. Nivas Singh, MMMUT, Gorakhpur, Uttar Pradesh, India
 Tai Kang, Nanyang Technological University, Singapore
 Valentina Balas, Aurel Vlaicu University of Arad, Romania
 Anil Kumar V., Associate Professor, ECE, IIIT Hyderabad, India

Technical Program Committee

Abdul Rajak A. R., Department of Electronics and Communication Engineering
 Birla Institute of Dr. Nitika Vats Doochan, Indore, India
 Ahmad Al-Khasawneh, The Hashemite University, Jordan
 Alexander Christea, University of Warwick, London, UK
 Amioy Kumar, Biometrics Research Lab, Department of Electrical Engineering, IIT Delhi, India
 Anand Paul, The School of Computer Science and Engineering, South Korea

Apurva A. Desai, Veer Narmad South Gujarat University, Surat, India
Avdesh Sharma, Jodhpur, India
A. K. Chaturvedi, Department of Electrical Engineering, IIT Kanpur, India
Bharat Singh Deora, JRNRV University, India
Bhavesht Joshi, Advent College, Udaipur, India
Brent Waters, University of Texas, Austin, Texas, USA
Chhaya Dalela, Associate Professor, JSSATE, Noida, Uttar Pradesh
Dan Boneh, Computer Science Department, Stanford University, California, USA
Feng Jiang, Harbin Institute of Technology, China
Gengshen Zhong, Jinan, Shandong, China
Harshal Arolkar, Immd. Past Chairman, CSI Ahmedabad Chapter, India
Amlan Chakraborti, Head, Professor, and Director, A. K. Choudhury School of IT, University of Calcutta
H. R. Vishwakarma, Professor, VIT, Vellore, India
Jayanti Dansana, KIIT University, Bhubaneswar, Odisha
Jean Michel Bruel, Departement Informatique IUT de Blagnac, Blagnac, France
Jeril Kuriakose, Manipal University, Jaipur, India
Jitender Kumar Chhabra, NIT Kurukshetra, Haryana, India
Kalpana Jain, CTAE, Udaipur, India
Komal Bhatia, YMCA University, Faridabad, Haryana, India
Krishnamachar Prasad, Department of Electrical and Electronic Engineering, Auckland, New Zealand
K. C. Roy, Principal, Kautaliya, Jaipur, India
Lorne Olfman, Claremont, California, USA
Martin Everett, University of Manchester, England
Meenakshi Tripathi, MNIT, Jaipur, India
Mukesh Shrimali, Pacific University, Udaipur, India
Murali Bhaskaran, Dhirajlal Gandhi College of Technology, Salem, Tamil Nadu, India
Nilay Mathur, Director, NIIT Udaipur, India
Ngai-Man Cheung, Assistant Professor, University of Technology and Design, Singapore
Philip Yang, Price Water House Coopers, Beijing, China
Pradeep Chouksey, Principal, TIT College, Bhopal, Madhya Pradesh, India
Prasun Sinha, Ohio State University Columbus, Columbus, OH, USA
Rajendra Kumar Bharti, Assistant Professor, Kumaon Engineering College, Dwarahat, Uttarakhand, India
Pradeep Chowriappa, Assistant Professor at Louisiana Tech University Ruston, Louisiana, USA
R. K. Bayal, Rajasthan Technical University, Kota, Rajasthan, India
Sami Mnasri, IRIT Laboratory Toulouse, France
Savita Gandhi, Professor, Gujarat University, Ahmedabad, India
Nishanth Dikkala, Research Engineer, MIT, Michigan, USA
Soura Dasgupta, Department of TCE, SRM University, Chennai, India

Sushil Kumar, School of Computer and Systems Sciences, Jawaharlal Nehru University, New Delhi, India
Prasad Mavuduri, CEO, University of Emerging Technologies University of Emerging Technologies, USA
S. R. Biradar, Department of Information Science and Engineering, SDM College of Engineering and Technology, Dharwad, Karnataka
Ting-Peng Liang, National Chengchi University, Taipei, Taiwan
Xiaoyi Yu, National Laboratory of Pattern Recognition, Institute of Automation, Chinese Academy of Sciences, Beijing, China
Yun-Bae Kim, Sungkyunkwan University, South Korea
Karuppanan, Professor, Electronics and Communication Engineering, Motilal Nehru National Institute of Technology, Allahabad
Raghava Rao Mukkamala, Director of the Centre for Business Data Analytics, CBDA, CBS, Denmark
Anil Kumar Vuppala, Assistant Professor, IIIT Hyderabad
P. Bala Prasad, Technology Head, TCS Hyderabad
M. Asha Rani, Professor, ECE, JNTUH, Hyderabad
P. Radha Krishna, Professor and Head, Computer Science and Engineering Department, National Institute of Technology, Warangal
Narayana Prasad Padhy, Dean of Academic Affairs, Professor and Institute Chair, Department of Electrical Engineering, IIT Roorkee
Sourav Mukhopadhyay, Professor, IIT Kharagpur
Sukumar Mishra, Professor, Department of Electrical Engineering, IIT Delhi
Siva Rama Krishna Vanjari, Associate Professor, Department of Electrical Engineering, IIT Hyderabad
Durga Prasad Mohapatra, Professor, Department of Computer Science and Engineering, National Institute of Technology Rourkela

Preface

This book is a collection of high-quality peer-reviewed research papers presented at the “7th International Conference on Information System Design and Intelligent Applications (INDIA-2022)” held at BVRIT HYDERABAD College of Engineering for Women, Hyderabad, India, during February 25–26, 2022.

After the success of past six editions of INDIA conferences which was initiated in the year 2012 and was first organized by Computer Society of India (CSI), Vizag Chapter. Its sequel, INDIA-2015, has been organized by Kalyani University, West Bengal, followed by INDIA-2016, organized by ANITS, Vizag, INDIA-2017, organized by Duy Tan University, Da Nang, Vietnam, INDIA-2018, organized by Université des Mascareignes, Mauritius, and INDIA-2019, organized by LIET, Vizianagaram. All papers of past INDIA editions are published by Springer Nature as publication partner. Presently, INDIA-2022 provided a platform for academicians, researchers, scientists, professionals, and students to share their knowledge and expertise in the diverse domain of intelligent computing and communication.

INDIA-2022 had received a number of submissions from the field of Information system design, intelligent applications, and its prospective applications in different spheres of engineering. The papers received have undergone a rigorous peer review process with the help of the technical program committee members of the conference from the various parts of country as well as abroad. The review process has been crucial with minimum two reviews each along with due checks on similarity and content overlap. This conference has featured theme-based special sessions in the domain of Blockchain 4.0, AI in IoT, Bio-Inspired Computing, etc., along with main track.

The conference featured many distinguished keynote addresses by eminent speakers like Prof. T. Bheemarjuna Reddy, Professor, CSE, IIT Hyderabad, India, who addressed the gathering on V2X Technologies toward connected and autonomous navigation regulation, challenges, and research opportunities. Prof. Amlan Chakrabarti, University of Calcutta, delivered a talk on IoT for Societal Applications. Prof. Sanjay Ranka, Distinguished Professor in the Department of Computer Information Science and Engineering at University of Florida, delivered a talk on AIML for Smart Transportation.

These keynote lectures/talks embraced a huge toll of audience of students, faculties, budding researchers as well as delegates. The editors thank General Chair, TPC Chair, and the Organizing Chair of the conference for providing valuable guidelines and inspirations to overcome various difficulties in the process of organizing this conference. The editors also thank BVRIT HYDERABAD College of Engineering for Women for their whole-hearted support in organizing this edition of INDIA conference.

The editorial board takes this opportunity to thank authors of all the submitted papers for their hard work, adherence to the deadlines, and patience during the review process. The quality of a refereed volume depends mainly on the expertise and dedication of the reviewers. We are indebted to the TPC members who not only produced excellent reviews but also did these in short time frames.

Bhubaneswar, India
Hyderabad, India
Lucknow, India

Suresh Chandra Satapathy
K. V. N. Sunitha
Vikrant Bhateja

Contents

A Framework for Early Recognition of Alzheimer’s Using Machine Learning Approaches	1
Lolla Kiran Kumar, P. Srinivasa Rao, and S. Sreenivasa Rao	
On the Studies and Analyzes of Facial Detection and Recognition Using Machine Learning Algorithms	15
Navya Thampan and Senthil Arumugam Muthukumaraswamy	
IPL Analysis and Match Prediction	29
Anjali Singhal, Deepanshi Agarwal, Esha Singh, Rajat Valecha, and Ritika Malik	
Application of ANN Combined with Machine Learning for Early Recognition of Parkinson’s Disease	39
Bharathi Uppalapati, S. Srinivasa Rao, and P. Srinivasa Rao	
People Count from Surveillance Video Using Convolution Neural Net	51
L. Lakshmi, A. Naga Kalyani, G. Naga Satish, and R. S. Murali Nath	
Detection of Pneumonia and COVID-19 from Chest X-Ray Images Using Neural Networks and Deep Learning	61
Jeet Santosh Nimbhorkar, Kurapati Sreenivas Aravind, K. Jeevesh, and Suja Palaniswamy	
Plant Leaf Disease Detection and Classification Using Deep Learning Technique	73
S. S. Bhoomika and K. M. Poornima	
Breast Mass Classification Using Convolutional Neural Network	85
Varsha Nemade, Sunil Pathak, Ashutosh Kumar Dubey, and Deepti Barhate	

Deep Generative Models Under GAN: Variants, Applications, and Privacy Issues	93
Remya Raveendran and Ebin Deni Raj	
Fusion-Based Celebrity Profiling Using Deep Learning	107
K. Adi Narayana Reddy, Naveen Kumar Laskari, G. Shyam Chandra Prasad, and N. Sreekanth	
DeepLeaf: Analysis of Plant Leaves Using Deep Learning	115
Deepti Barhate, Sunil Pathak, Ashutosh Kumar Dubey, and Varsha Nemade	
Potential Assessment of Wind Power Generation Using Machine Learning Algorithms for Southern Region of India	125
P. Upendra Kumar, K. Lakshmana Rao, and T. S. Kishore	
OCR-LSTM: An Efficient Number Plate Detection System	135
M. Indrasena Reddy, K. Srinivasa Reddy, B. Rakesh, and K. Prathima	
Artificial Neural Network Alert Classifier for Construction Equipments Telematics (CET)	147
Mohan Gopal Raje Urs, S. P. Shiva Prakash, and Kirill Krinkin	
Hybrid Approach of Modified IWD and Machine Learning Techniques for Android Malware Detection	157
Ravi Mohan Sharma and Chaitanya P. Agrawal	
Intuitionistic Fuzzy 9 Intersection Matrix for Obtaining the Relationship Between Indeterminate Objects	171
Subhankar Jana and Juthika Mahanta	
A Hybrid Model of Latent Semantic Analysis with Graph-Based Text Summarization on Telugu Text	179
Aluri Lakshmi and D. Latha	
A Combined Approach of Steganography and Cryptography with Generative Adversarial Networks: Survey	187
Kakunuri Sandya and Subhadra Kompella	
Real-Time Accident Detection and Intimation System Using Deep Neural Networks	197
K. Padma Vasavi	
Design of Cu-Doped SnO₂ Thick-Film Gas Sensor for Methanol Using ANN Technique	207
Amit Gupta, Shashi Kant Dargar, A. V. Nageswara Rao, and B. Raghavaiah	
Detect Traffic Lane Image Using Geospatial LiDAR Data Point Clouds with Machine Learning Analysis	217
M. Shanmuga Sundari, M. Sudha Rani, and A. Kranthi	

Classification of High-Dimensionality Data Using Machine Learning Techniques 227
 D. Padmaja Usharani, G. Sridevi, Rambabu Pemula, and Sagenela Vijaya Kumar

To Detect Plant Disease Identification on Leaf Using Machine Learning Algorithms 239
 P. Praveen, Mandala Nischitha, Chilupuri Supriya, Mitta Yogitha, and Aakunoori Suryanandh

Association and Correlation Analysis for Predicting the Anomaly in the Stock Market 251
 R. Ravinder Reddy, M. Venkata Krishna Reddy, and L. Raghavender Raju

Early Identification of Diabetic Retinopathy Using Deep Learning Techniques 261
 Sachin Sharma, Sakshi Zanje, and Dharmesh Shah

Performance Evaluation of MLP and CNN Models for Flood Prediction 273
 Ippili Saikrishna Macharyulu, Deba Prakash Satapathy, Abinash Sahoo, Sandeep Samantaray, Nihar Ranjan Mohanta, and Arkajyoti Ray

Bidirectional LSTM-Based Sentiment Analysis of Context-Sensitive Lexicon for Imbalanced Text 283
 P. Krishna Kishore, K. Prathima, Dutta Sai Eswari, and Konda Srikar Goud

Improving Streamflow Prediction Using Hybrid BPNN Model Combined with Particle Swarm Optimization 299
 Nagarampalli Manoj Kumar, Ippili Saikrishnamacharyulu, Abinash Sahoo, Sandeep Samantaray, Mavoori Hitesh Kumar, Akash Naik, and Srinibash Sahoo

Prediction of Pullout Resistance of Geogrids Using ANN 309
 Ippili Saikrishna Amacharyulu, Balendra Mouli Marrapu, and Vasala Madhava Rao

Simulation of Water Table Depth Using Hybrid CANFIS Model: A Case Study 319
 Ippili Saikrishnamacharyulu, Nihar Ranjan Mohanta, Mavoori Hitesh Kumar, Sandeep Samantaray, Abinash Sahoo, Prameet Kumar Nanda, and Priyashree Ekka

Monthly Runoff Prediction by Support Vector Machine Based on Whale Optimisation Algorithm 329
Aiswarya Mishra, Abinash Sahoo, Sandeep Samantaray, Deba Prakash Satapathy, and Suresh Chandra Satapathy

Application of Adaptive Neuro-Fuzzy Inference System and Salp Swarm Algorithm for Suspended Sediment Load Prediction 339
Gopal Krishna Sahoo, Abinash Sahoo, Sandeep Samantara, Deba Prakash Satapathy, and Suresh Chandra Satapathy

Maturity Status Estimation of Banana Using Image Deep Feature and Parallel Feature Fusion 349
Ashoka Kumar Ratha, Prabira Kumar Sethy, Nalini Kanta Barpanda, and Santi Kumari Behera

Application of a Combined GRNN-FOA Model for Monthly Rainfall Forecasting in Northern Odisha, India 355
Deba Prakash Satapathy, Harapriya Swain, Abinash Sahoo, Sandeep Samantaray, and Suresh Chandra Satapathy

Guided Image Filter and SVM-Based Automated Classification of Microscopy Images 365
Vikrant Bhateja, Disha Singh, and Ankit Yadav

Application of Machine Learning Algorithms for Creating a Wilful Defaulter Prediction Model 373
B. Uma Maheswari, Hari Shankar Chandran, R. Sujatha, and D. Kavitha

Design of Metamaterial-Based Multilayer Dual Band Circularly Polarized Microstrip Patch Antenna 383
Chirag Arora

Heart Disease Prediction in Healthcare Communities by Machine Learning Over Big Data 391
Lingala Thirupathi, B. Srinivasulu, Unnati Khanapurkar, D. Rambabu, and C. M. Preeti

A Novel Twitter Sentimental Analysis Approach Using Naive Bayes Classification 401
Lingala Thirupathi, G. Rekha, S. K. Shruthi, B. Sowjanya, and Sowmya Jujuroo

Recognition and Adoption of an Abducted Child Using Haar Cascade Classifier and JSON Model 409
Ghousia Begum, C. Kishor Kumar Reddy, and P. R. Anisha

Automatic Brain Tumor Detection Using Convolutional Neural Networks 419
Amtul B. Ifra and Madiha Sadaf

Deep Learning and Blockchain for Electronic Health Record in Healthcare System 429
 Ch. Sravanthi and Smitha Chowdary

Artificial Neural Networks in Improvement of Spatial Resolution of Thermal Infrared Data 437
 Mallam Gurudeep, Gaddam Samatha, Sandeep Ravikanti, and Gopal Rao Kulkarni

Facial Micro-expression Recognition Using Deep Learning 447
 Nasaka Ravi Praneeth, Godavarthi Sri Sai Vikas, Ravuri Naveen Kumar, and T. Anuradha

Precision Agriculture with Weed Detection Using Deep Learning 455
 I. Deva Kumar, J. Sai Rashitha Sree, M. Devi Sowmya, and G. Kalyani

An Ensemble Model to Detect Parkinson’s Disease Using MRI Images 465
 T. Sri Lakshmi, B. Lakshmi Ramani, Rohith Kumar Jayana, Satwik Kaza, Soma Sai Surya Teja Kamatam, and Bhimala Raghava

Classification of Diabetic Retinopathy Using Deep Neural Networks 475
 J. Hyma, M. Ramakrishna Murty, S. Ranjan Mishra, and Y. Anuradha

A Deep Learning Model for Stationary Audio Noise Reduction 483
 Sanket S. Kulkarni, Ansuman Mahapatra, and T. Bala Sundar

Optimizing Deep Neural Network for Viewpoint Detection in 360-Degree Images 491
 Surya Raj and Ansuman Mahapatra

ConvNet of Deep Learning in Plant Disease Detection 501
 J. Gajavalli and S. Jeyalakshmi

Recognition of Iris Segmentation Using CNN and Neural Networks 515
 S. Jeyalakshmi and P. J. Sai Vignesh

Popularity of Optimization Techniques in Sentiment Analysis 523
 Priyanka and Kirti Walia

Predominant Role of Artificial Intelligence in Employee Retention 535
 Ravinder Kaur and Hardeep Kaur

Semantic Segmentation of Brain MRI Images Using Squirrel Search Algorithm-Based Deep Convolution Neural Network 547
 B. Tapasvi, E. Gnana Manoharan, and N. Udaya Kumar

Top Five Machine Learning Libraries in Python: A Comparative Analysis 559
 Mothe Rajesh and M. Sheshikala

A Novel Technique of Threshold Distance-Based Vehicle Tracking System for Woman Safety 567
B. V. D. S. Sekhar, V. V. S. S. S. Chakravarthy, S. Venkataramana,
Bh. V. S. R. K. Raju, N. Udayakumar, and S. Krishna Rao

Author Index 579

Editors and Contributors

About the Editors

Vikrant Bhateja is the associate professor in the Department of ECE, SRMGPC, Lucknow (U.P.), and also the dean (Academics) in the same college. He is doctorate in ECE (Bio-Medical Imaging) with a total academic teaching experience of 18 years with around 180 publications in reputed international conferences, journals and online book chapter contributions, out of which 31 papers are published in SCIE indexed high impact factored journals. He has been instrumental in chairing/co-chairing around 30 international conferences in India and abroad as publication/TPC chair and edited 45 book volumes from Springer Nature as a corresponding/co-editor/author on date. He has delivered nearly 20 keynotes, invited talks in international conferences, ATAL, TEQIP and other AICTE sponsored FDPs and STTPs. He is Editor-in-Chief of IGI *Global-International Journal of Natural Computing and Research* (IJNCR) an ACM and DBLP indexed journal since 2017. He has guest edited special issues in reputed SCIE indexed journals under Springer Nature and Elsevier.

K. V. N. Sunitha completed her B.Tech. in ECE from ANU, M.Tech. in CS from REC Warangal in 1993 and Ph.D. in CSE from JNTU Hyderabad in 2006. She has 29 years of teaching experience and 13 years of research experience. She is working as Founder Principal, BVRIT Hyderabad College of Engineering for Women, Hyderabad, since August 2012. She received “Academic Excellence Award” by G. Narayanamma Institute of Technology and Science in 2005, “Best Computer Science Engineering Teacher Award for the year 2007” by ISTE in 2008, “Best Faculty Award” in Academic Brilliance Awards, 2013 at New Delhi, “Distinguished Principal Award” by CSI Mumbai in 2017 at IIT Bombay, received Deewang Mehtha “Women in Education Award” in 2017. She was felicitated for outstanding contribution and achievements in the field of Engineering in Women Engineers Meet 29th Indian Engineering Congress, IEI held at Visveswaraiah Bhavan, Hyderabad on 18 December 2014. She received “Engineer of the year 2019 Award” by IEI, Telangana in 2019. She received “Acharya Ratna”–National Award for life-time achievement for the year by Indian servers in association with IT Association of AP, Telangana

IT Association, in 2019. She has guided 9 Ph.Ds. and currently guiding 8 research scholars. She authored 5 text books, published more than 150 papers.

Yen-Wei Chen received the B.E. degree in 1985 from Kobe University, Kobe, Japan, the M.E. degree in 1987 and the D.E. degree in 1990, both from Osaka University, Osaka, Japan. He was a research fellow with the Institute for Laser Technology, Osaka, from 1991 to 1994. From October 1994 to March 2004, he was an associate professor and a professor with the Department of Electrical and Electronic Engineering, University of the Ryukyus, Okinawa, Japan. He is currently a professor with the college of Information Science and Engineering, Ritsumeikan University, Japan. He is also a visiting professor with the College of Computer Science, Zhejiang University, China. He was a visiting professor with the Oxford University, Oxford, UK, in 2003 and a visiting professor with Pennsylvania State University, USA, in 2010. His research interests include medical image analysis, computer vision and computational intelligence. He has published more than 300 research papers in a number of leading journals and leading conferences including *IEEE Transactions on Image Processing*, *IEEE Transactions on SMC*, *Pattern Recognition*. He has received many distinguished awards including ICPR2012 Best Scientific Paper Award, 2014 JAMIT Best Paper Award, Outstanding Chinese Oversea Scholar Fund of Chinese Academy of Science. He is/was a leader of numerous national and industrial research projects.

Yu-Dong Zhang received his Ph.D. degree from Southeast University, China, in 2010. He worked as postdoc from 2010 to 2012 and a research scientist from 2012 to 2013 at Columbia University, USA. He served as Professor from 2013 to 2017 in Nanjing Normal University, where he was the director and founder of Advanced Medical Image Processing Group in NJNU. From 2017, he served as Full Professor in Department of Informatics, University of Leicester, UK. His research interests are deep learning in communication and signal processing, medical image processing. He was included in “Most Cited Chinese researchers (Computer Science)” from 2015 to 2018. He won “Emerald Citation of Excellence 2017”, and “MDPI Top 10 Most Cited Papers 2015”. He was included in top scientist list in “Guide2Research”. He is now the editor of *Scientific Reports*, *Journal of Alzheimer’s Disease*, *International Journal of Information Management*, etc. He is the senior member of IEEE and ACM. He has conducted and joined many successful academic grants and industrial projects, such as NSFC, NIH, EPSRC, etc.

Contributors

Adi Narayana Reddy K. BVRIT HYDERABAD College of Engineering for Women, Hyderabad, Telangana, India

Agarwal Deepanshi Computer Science and Engineering, Inderprastha Engineering College, Ghaziabad, India

Agrawal Chaitanya P. Department of Computer Science and Applications, Makhanlal Chaturvedi University, Bhopal, Madhya Pradesh, India

Amacharyulu Ippili Saikrishna Department of Civil Engineering, GIET University, Bhubaneswar, India

Anisha P. R. Stanley College of Engineering and Technology for Women, Hyderabad, Telangana, India

Anuradha T. Department of Information Technology, Velagapudi Ramakrishna Siddhartha Engineering College, Vijayawada, India

Anuradha Y. Department of CSE, G.V.P College of Engineering (A), Visakhapatnam, India

Aravind Kurapati Sreenivas Department of Computer Science and Engineering, Amrita School of Engineering, Bengaluru, India

Arora Chirag KIET Group of Institutions, Delhi-NCR, Ghaziabad, Uttar Pradesh, India

Bala Sundar T. National Institute of Technology Puducherry, Puducherry, India

Barhate Deepati SVKM's NMIMS MPSTME Shirpur, Dhule, Maharashtra, India; Amity School of Engineering & Technology, Department of Computer Science & Engineering, Amity University Rajasthan, Jaipur, India

Barpanda Nalini Kanta Department of Electronics, Sambalpur University, Burla, Odisha, India

Begum Ghouseia Stanley College of Engineering and Technology for Women, Hyderabad, Telangana, India

Behera Santi Kumari Department of Computer Science and Engineering, VSSUT Burla, Burla, Odisha, India

Bhateja Vikrant Department of Electronics and Communication Engineering, Shri Ramswaroop Memorial College of Engineering and Management (SRMCEM), Lucknow, Uttar Pradesh, India;

Dr. A. P. J. Abdul Kalam Technical University (AKTU), Lucknow, Uttar Pradesh, India

Bhoomika S. S. Department of Information Science and Engineering, GM Institute of Technology, Shimoga, Karnataka, India

Chakravarthy V. V. S. S. S. Raghu Institute of Technology, Dakamari, Visakhapatnam, Andhra Pradesh, India

Chandran Hari Shankar PSG Institute of Management, Coimbatore, Tamil Nadu, India

Chowdary Smitha Koneru Lakshmaiah Educational Foundation, Vijayawada, Andhra Pradesh, India

Dargar Shashi Kant Department of Electronics and Communication Engineering, Kalasalingam Academy of Research and Education, Krishnankoil, Tamil Nadu, India

Deva Kumar I. Velagapudi Ramakrishna Siddhartha Engineering College, Vijayawada, Andhra Pradesh, India

Devi Sowmya M. Velagapudi Ramakrishna Siddhartha Engineering College, Vijayawada, Andhra Pradesh, India

Dubey Ashutosh Kumar Chitkara University School of Engineering and Technology, Chitkara University, Himachal Pradesh, India

Eswari Dutta Sai Department of IT, BVRIT Hyderabad College of Engineering for Women, Hyderabad, India

Gajavalli J. Vels Institute of Science, Technology and Advanced Studies, Chennai, Tamil Nadu, India

Gnana Manoharan E. ECE Department, Annamalai University, Chidambaram, India

Goud Konda Srikar Department of IT, BVRIT Hyderabad College of Engineering for Women, Hyderabad, India

Gupta Amit Department of Electronics and Communications Engineering, NEC, Narasaraopeta, Andhra Pradesh, India

Gurudeep Mallam Department of ECE, MCET Hyderabad, Hyderabad, India

Hyma J. Department of CSE, GITAM University (Deemed to Be), Visakhapatnam, India

Ifra Amtul B. Shadan Women's College of Engineering and Technology, Hyderabad, Telangana, India

Indrasena Reddy M. Computer Science & Engineering Department, BVRIT HYDERABAD College of Engineering for Women, Hyderabad, Telangana, India

Jana Subhankar Department of Mathematics, National Institute of Technology Silchar, Silchar, Assam, India

Jayana Rohith Kumar Prasad V. Potluri, Siddhartha Institute of Technology, Vijayawada, Andhra Pradesh, India

Jeevesh K. Department of Computer Science and Engineering, Amrita School of Engineering, Bengaluru, India

Jeyalakshmi S. Vels Institute of Science, Technology and Advanced Studies, Chennai, Tamil Nadu, India

Jujuroo Sowmya CSE Department, Methodist College of Engineering & Technology, Hyderabad, Telangana, India

Kalyani G. Velagapudi Ramakrishna Siddhartha Engineering College, Vijayawada, Andhra Pradesh, India

Kamatam Soma Sai Surya Teja Prasad V. Potluri, Siddhartha Institute of Technology, Vijayawada, Andhra Pradesh, India

Kaur Hardeep University Business Schools, Chandigarh University, Mohali, India

Kaur Ravinder University Business Schools, Chandigarh University, Mohali, India

Kavitha D. PSG Institute of Management, Coimbatore, Tamil Nadu, India

Kaza Satwik Prasad V. Potluri, Siddhartha Institute of Technology, Vijayawada, Andhra Pradesh, India

Khanapurkar Unnati CSE Department, Methodist College of Engineering & Technology, Hyderabad, Telangana, India

Kishor Kumar Reddy C. Stanley College of Engineering and Technology for Women, Hyderabad, Telangana, India

Kishore T. S. GMR Institute of Technology, Vizianagaram, Andhra Pradesh, India

Kompella Subhadra GITAM Deemed to Be University, Vishakhapatnam, India

Kranthi A. BVRIT Hyderabad College of Engineering for Women, Hyderabad, Bachupally, India

Krinkin Kirill Department of Software Engineering and Computer Applications, Saint Petersburg Electrotechnical University “LETI”, Saint Petersburg, Russia

Krishna Kishore P. Department of IT, BVRIT Hyderabad College of Engineering for Women, Hyderabad, India

Kulkarni Gopal Rao IIT BOMBAY, Mumbai, India

Kulkarni Sanket S. National Institute of Technology Puducherry, Puducherry, India

Kumar Lolla Kiran MVGR College of Engineering (A), Vizianagaram, Andhra Pradesh, India

Kumar Mavoori Hitesh Department of Civil Engineering, NIT Tiruchirappalli, Tiruchirappalli, Tamil Nadu, India

Kumar Nagarampalli Manoj Department of Civil Engineering, GIET University Gunpur, Bhubaneswar, Odisha, India

Kumar Ravuri Naveen Department of Information Technology, Velagapudi Ramakrishna Siddhartha Engineering College, Vijayawada, India

Kumar Sagenela Vijaya Department of Computer Science and Engineering, School of Technology, GITAM (Deemed to be University), Hyderabad, India

Lakshmana Rao K. GMR Institute of Technology, Vizianagaram, Andhra Pradesh, India

Lakshmi Aluri Adikavi Nannaya University, Rajamahendravaram, Andhra Pradesh, India

Lakshmi L. BVRIT HYDERABAD College of Engineering for Women, Hyderabad, India

Lakshmi T. Sri Prasad V. Potluri, Siddhartha Institute of Technology, Vijayawada, Andhra Pradesh, India

Laskari Naveen Kumar BVRIT HYDERABAD College of Engineering for Women, Hyderabad, Telangana, India

Latha D. Adikavi Nannaya University, Rajamahendravaram, Andhra Pradesh, India

Macharyulu Ippili Saikrishna Department of Civil Engineering, GIET University, Bhubaneswar, Odisha, India

Mahanta Juthika Department of Mathematics, National Institute of Technology Silchar, Silchar, Assam, India

Mahapatra Ansuman National Institute of Technology Puducherry, Karaikal, Puducherry, India

Malik Ritika Computer Science and Engineering, Inderprastha Engineering College, Ghaziabad, India

Marrapu Balendra Mouli Department of Civil Engineering, AITAM, Visakhapatnam, India

Mishra Aiswarya Department of Civil Engineering, OUTR Bhubaneswar, Bhubaneswar, Odisha, India

Mohanta Nihar Ranjan Department of Civil Engineering, NIT Raipur, Raipur, Chhattisgarh, India

Murali Nath R. S. BVRIT HYDERABAD College of Engineering for Women, Hyderabad, India

Muthukumaraswamy Senthil Arumugam School of Engineering and Physical Sciences, Heriot-Watt University, Dubai, United Arab Emirates

Naga Kalyani A. BVRIT HYDERABAD College of Engineering for Women, Hyderabad, India

Naga Satish G. BVRIT HYDERABAD College of Engineering for Women, Hyderabad, India

Nageswara Rao A. V. Department of Electronics and Communications Engineering, NEC, Narasaraopeta, Andhra Pradesh, India

Naik Akash Department of Civil Engineering, GIET University Gunpur, Bhubaneswar, Odisha, India

Nanda Prameet Kumar Department of Civil Engineering, GIET University Gunpur, Gunpur, Odisha, India

Nemade Varsha Department of Computer Science & Engineering, Amity School of Engineering & Technology, Amity University Rajasthan, Jaipur, India; SVKM's NMIMS MPSTME Shirpur, Dhule, Maharashtra, India

Nimbhorkar Jeet Santosh Department of Computer Science and Engineering, Amrita School of Engineering, Bengaluru, India

Nischitha Mandala Department of Computer Science Engineering, SR Engineering College, Warangal, Telangana, India

Padma Vasavi K. Shri Vishnu Engineering College for Women, Bhimavaram, India

Padmaja Usharani D. Department of Computer Science and Engineering, Raghu Engineering College, Visakhapatnam, India

Palaniswamy Suja Department of Computer Science and Engineering, Amrita School of Engineering, Bengaluru, India

Pathak Sunil Department of Computer Science & Engineering, Amity School of Engineering & Technology, Amity University Rajasthan, Jaipur, India

Pemula Rambabu Department of Computer Science and Engineering, Raghu Engineering College, Visakhapatnam, India

Poornima K. M. Department of Computer Science and Engineering, JNN College of Engineering, Shimoga, Karnataka, India

Praneeth Nasaka Ravi Department of Information Technology, Velagapudi Ramakrishna Siddhartha Engineering College, Vijayawada, India

Prathima K. Computer Science & Engineering Department, BVRIT HYDERABAD College of Engineering for Women, Hyderabad, Telangana, India

Praveen P. Department of Computer Science and Artificial Intelligence, SR University, Warangal, Telangana, India

Preeti C. M. CSE Department, Institute of Aeronautical Engineering, Hyderabad, Telangana, India

Priyanka University Institute of Computing, Chandigarh University Gharuan, Punjab, India

Priyashree Ekka Department of Civil Engineering, GIET University Gunpur, Gunpur, Odisha, India

Raghava Bhimala Prasad V. Potluri, Siddhartha Institute of Technology, Vijayawada, Andhra Pradesh, India

Raghavaiah B. Department of Electronics and Communications Engineering, NEC, Narasaraopeta, Andhra Pradesh, India

Raghavender Raju L. Department of Computer Science and Engineering, Matrusri Engineering College, Hyderabad, India

Raj Ebin Deni Indian Institute of Information Technology, Kottayam, Kerala, India

Raj Surya National Institute of Technology Puducherry, Karaikal, Puducherry, India

Rajesh Mothe SR University, Warangal, Telangana, India

Raju Bh. V. S. R. K. S R K R Engineering College, Bhimavaram, Andhra Pradesh, India

Rakesh B. Computer Science & Engineering Department, BVRIT HYDERABAD College of Engineering for Women, Hyderabad, Telangana, India

Ramakrishna Murty M. Department of CSE, Anil Neerukonda Institute of Technology & Sciences (ANITS), Visakhapatnam, India

Ramani B. Lakshmi Prasad V. Potluri, Siddhartha Institute of Technology, Vijayawada, Andhra Pradesh, India

Rambabu D. CSE Department, Sreenidhi Institute of Science & Technology, Hyderabad, Telangana, India

Ranjan Mishra S. Department of CSE, Anil Neerukonda Institute of Technology & Sciences (ANITS), Visakhapatnam, India

Rao S. Krishna Sir C R R Engineering College, Eluru, Andhra Pradesh, India

Rao Vasala Madhava Department of Civil Engineering, GIET University, Bhubaneswar, India

Ratha Ashoka Kumar Department of Electronics, Sambalpur University, Burla, Odisha, India

Raveendran Remya Indian Institute of Information Technology, Kottayam, Kerala, India

Ravikanti Sandeep Methodist College of Engineering & Technology, CSE, Hyderabad, India

Ravinder Reddy R. Department of Computer Science and Engineering, Chaitanya Bharathi Institute of Technology(A), Gandipet, Hyderabad, India

Ray Arkajyoti Department of Civil Engineering, GIET University, Bhubaneswar, Odisha, India

Rekha G. CSE Department, Kakatiya Institute of Technology & Science, Warangal, Telangana, India

Sadaf Madiha Chaitanya Bharathi Institute of Technology, Hyderabad, India

Sahoo Abinash Department of Civil Engineering, NIT Silchar, Silchar, Assam, India

Sahoo Gopal Krishna Department of Civil Engineering, OUTR Bhubaneswar, Bhubaneswar, Odisha, India

Sahoo Srinibash Department of Civil Engineering, GIET University Gunpur, Bhubaneswar, Odisha, India

Sai Rashitha Sree J. Velagapudi Ramakrishna Siddhartha Engineering College, Vijayawada, Andhra Pradesh, India

Sai Vignesh P. J. Rajalakshmi Engineering College, Thandalam, Chennai, India

Saikrishnamacharyulu Ippili Department of Civil Engineering, GIET University Gunpur, Bhubaneswar, Odisha, India;
Department of Civil Engineering, GIET University Gunpur, Gunpur, Odisha, India

Samantaray Sandeep Department of Civil Engineering, OUTR Bhubaneswar, Bhubaneswar, Odisha, India

Samatha Gaddam Department of ECE, JBIET Hyderabad, Hyderabad, India

Sandya Kakunuri GITAM Deemed to Be University, Vishakhapatnam, India

Satapathy Deba Prakash Department of Civil Engineering, OUTR Bhubaneswar, Bhubaneswar, Odisha, India

Satapathy Suresh Chandra Department of Computer Science and Engineering, KIIT University, Bhubaneswar, Odisha, India

Sekhar B. V. D. S. S R K R Engineering College, Bhimavaram, Andhra Pradesh, India

Sethy Prabira Kumar Department of Electronics, Sambalpur University, Burla, Odisha, India

Shah Dharmesh Faculty of Engineering and Technology, Sankalchand Patel University, Visnagar, India

Shanmuga Sundari M. BVRIT Hyderabad College of Engineering for Women, Hyderabad, Bachupally, India

Sharma Ravi Mohan Department of Computer Science and Applications, Makhanlal Chaturvedi University, Bhopal, Madhya Pradesh, India

Sharma Sachin Department of Engineering and Physical Sciences, Institute of Advanced Research, Gandhinagar, India

Sheshikala M. SR University, Warangal, Telangana, India

Shiva Prakash S. P. Department of Information Science and Engineering, JSS Science and Technology University, Mysuru, Karnataka, India

Shruthi S. K. CSE Department, Methodist College of Engineering & Technology, Hyderabad, Telangana, India

Shyam Chandra Prasad G. Matrusri Engineering College, Hyderabad, Telangana, India

Singh Disha Department of Electronics and Communication Engineering, Shri Ramswaroop Memorial College of Engineering and Management (SRMCEM), Lucknow, Uttar Pradesh, India;

Dr. A. P. J. Abdul Kalam Technical University (AKTU), Lucknow, Uttar Pradesh, India

Singh Esha Computer Science and Engineering, Inderprastha Engineering College, Ghaziabad, India

Singhal Anjali Computer Science and Engineering, Inderprastha Engineering College, Ghaziabad, India

Sowjanya B. CSE Department, Methodist College of Engineering & Technology, Hyderabad, Telangana, India

Sravanthi Ch. G. Narayanamma Institute of Technology & Science, Hyderabad, Telangana, India

Sreekanth N. BVRIT HYDERABAD College of Engineering for Women, Hyderabad, Telangana, India

Sreenivasa Rao S. Department of Computer Science & Engineering, MVGR College of Engineering (A), Vizianagaram, Andhra Pradesh, India

Sridevi G. Department of Computer Science and Engineering, Raghu Engineering College, Visakhapatnam, India

Srinivasa Rao P. Department of Computer Science & Engineering, MVGR College of Engineering (A), Vizianagaram, Andhra Pradesh, India

Srinivasa Rao S. Department of CSE, MVGR College of Engineering (A), Vizianagaram, Andhra Pradesh, India

Srinivasa Reddy K. Computer Science & Engineering Department, BVRIT HYDERABAD College of Engineering for Women, Hyderabad, Telangana, India

Srinivasulu B. CSE Department, Vidya Jyothi Institute of Technology, Hyderabad, Telangana, India

Sudha Rani M. BVRIT Hyderabad College of Engineering for Women, Hyderabad, Bachupally, India

Sujatha R. PSG Institute of Management, Coimbatore, Tamil Nadu, India

Supriya Chilupuri Department of Computer Science Engineering, SR Engineering College, Warangal, Telangana, India

Suryanandh Aakunoori Department of Computer Science Engineering, SR Engineering College, Warangal, Telangana, India

Swain Harapriya Department of Civil Engineering, OUTR Bhubaneswar, Bhubaneswar, Odisha, India

Tapasvi B. ECE Department, Annamalai University, Chidambaram, India

Thampan Navya School of Engineering and Physical Sciences, Heriot-Watt University, Dubai, United Arab Emirates

Thirupathi Lingala CSE Department, Stanley College of Engineering and Technology for Women, Hyderabad, Telangana, India

Udaya Kumar N. ECE Department, SRKR Engineering College, Bhimavaram, Andhra Pradesh, India

Uma Maheswari B. PSG Institute of Management, Coimbatore, Tamil Nadu, India

Uppendra Kumar P. GMR Institute of Technology, Vizianagaram, Andhra Pradesh, India

Uppalapati Bharathi Department of CSE, MVGR College of Engineering (A), Vizianagaram, Andhra Pradesh, India

Urs Mohan Gopal Raje Department of Information Science and Engineering, JSS Science and Technology University, Mysuru, Karnataka, India

Valecha Rajat Computer Science and Engineering, Inderprastha Engineering College, Ghaziabad, India

Venkata Krishna Reddy M. Department of Computer Science and Engineering, Chaitanya Bharathi Institute of Technology(A), Gandipet, Hyderabad, India

Venkataramana S. S R K R Engineering College, Bhimavaram, Andhra Pradesh, India

Vikas Godavarthi Sri Sai Department of Information Technology, Velagapudi Ramakrishna Siddhartha Engineering College, Vijayawada, India

Walia Kirti University Institute of Computing, Chandigarh University Gharuan, Punjab, India

Yadav Ankit Department of Electronics and Communication Engineering, Shri Ramswaroop Memorial College of Engineering and Management (SRMCEM), Lucknow, Uttar Pradesh, India;

Dr. A. P. J. Abdul Kalam Technical University (AKTU), Lucknow, Uttar Pradesh, India

Yogitha Mitta Department of Computer Science Engineering, SR Engineering College, Warangal, Telangana, India

Zanje Sakshi Department of Engineering and Physical Sciences, Institute of Advanced Research, Gandhinagar, India