

Advances in Intelligent Systems and Computing

Volume 933

Series Editor

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

Advisory Editors

Nikhil R. Pal, Indian Statistical Institute, Kolkata, India

Rafael Bello Perez, Faculty of Mathematics, Physics and Computing,
Universidad Central de Las Villas, Santa Clara, Cuba

Emilio S. Corchado, University of Salamanca, Salamanca, Spain

Hani Hagras, School of Computer Science & Electronic Engineering,
University of Essex, Colchester, UK

László T. Kóczy, Department of Automation, Széchenyi István University,
Gyor, Hungary

Vladik Kreinovich, Department of Computer Science, University of Texas
at El Paso, El Paso, TX, USA

Chin-Teng Lin, Department of Electrical Engineering, National Chiao
Tung University, Hsinchu, Taiwan

Jie Lu, Faculty of Engineering and Information Technology,
University of Technology Sydney, Sydney, NSW, Australia

Patricia Melin, Graduate Program of Computer Science, Tijuana Institute
of Technology, Tijuana, Mexico

Nadia Nedjah, Department of Electronics Engineering, University of Rio de Janeiro,
Rio de Janeiro, Brazil

Ngoc Thanh Nguyen, Faculty of Computer Science and Management,
Wrocław University of Technology, Wrocław, Poland

Jun Wang, Department of Mechanical and Automation Engineering,
The Chinese University of Hong Kong, Shatin, Hong Kong

The series “Advances in Intelligent Systems and Computing” contains publications on theory, applications, and design methods of Intelligent Systems and Intelligent Computing. Virtually all disciplines such as engineering, natural sciences, computer and information science, ICT, economics, business, e-commerce, environment, healthcare, life science are covered. The list of topics spans all the areas of modern intelligent systems and computing such as: computational intelligence, soft computing including neural networks, fuzzy systems, evolutionary computing and the fusion of these paradigms, social intelligence, ambient intelligence, computational neuroscience, artificial life, virtual worlds and society, cognitive science and systems, Perception and Vision, DNA and immune based systems, self-organizing and adaptive systems, e-Learning and teaching, human-centered and human-centric computing, recommender systems, intelligent control, robotics and mechatronics including human-machine teaming, knowledge-based paradigms, learning paradigms, machine ethics, intelligent data analysis, knowledge management, intelligent agents, intelligent decision making and support, intelligent network security, trust management, interactive entertainment, Web intelligence and multimedia.

The publications within “Advances in Intelligent Systems and Computing” are primarily proceedings of important conferences, symposia and congresses. They cover significant recent developments in the field, both of a foundational and applicable character. An important characteristic feature of the series is the short publication time and world-wide distribution. This permits a rapid and broad dissemination of research results.

**** Indexing: The books of this series are submitted to ISI Proceedings, EI-Compendex, DBLP, SCOPUS, Google Scholar and Springerlink ****

More information about this series at <http://www.springer.com/series/11156>

Milan Tuba · Shyam Akashe · Amit Joshi
Editors

Information and Communication Technology for Sustainable Development

Proceedings of ICT4SD 2018

Editors

Milan Tuba
Singidunum University
Belgrade, Serbia

Amit Joshi
Sabar Institute of Technology
Gujarat Technological University
Ahmedabad, Gujarat, India

Shyam Akashe
Department of Electronics
and Communication Engineering
ITM University
Gwalior, Madhya Pradesh, India

ISSN 2194-5357

ISSN 2194-5365 (electronic)

Advances in Intelligent Systems and Computing

ISBN 978-981-13-7165-3

ISBN 978-981-13-7166-0 (eBook)

<https://doi.org/10.1007/978-981-13-7166-0>

Library of Congress Control Number: 2019934355

© Springer Nature Singapore Pte Ltd. 2020

This work is subject to copyright. All rights are reserved 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

Organization

Organizing Chairs

Mr. Bharat Patel, Vice Chairman, ASSOCHAM Western Region
Mr. Peter Kent, Chief Executive Officer (CEO), UKEL, UK

Organizing Co-Chair

Mr. Nakul Sharedalal, Advisor, G R Foundation, India

Organizing Secretary

Amit Joshi, SITG, Ahmedabad, and Global Knowledge Research Foundation

Members

Dr. Vijay Singh Rathore, Department of CSE, JECRC, Jaipur, India
Mr. Aman Barot, G R Foundation, India
Dr. Mahipal Singh Deora, BN University, Udaipur, India
Dr. Nisheeth Joshi, Banasthali University, Rajasthan, India
Mr. Nilesh Vaghela, Electromech, Ahmedabad, India
Mr. Vinod Thummar, SITG, Ahmedabad, Gujarat, India
Dr. Chirag Thaker, L D College of Engineering, Gujarat, India
Prof. S. Rama Rao, Goa University, Goa, India
Dr. Nitika Vats Doohan, Indore, India

Dr. Parikshit Mahalle, Sinhgad Group, Pune, India
Dr. Priyanks Sharma, RSU, Ahmedabad
Dr. Nitika Vats Doohan, Indore
Dr. Mukesh Sharma, SFSU, Jaipur
Dr. Manuj Joshi, SGI, Udaipur, India
Dr. Bharat Singh Deora, JRNRV University, Udaipur, India
Mr. Ricky, P. Tunes, Goa University, India
Prof. L. C. Bishnoi, GPC, Kota, India
Dr. Vikarant Bhateja, Lucknow, India
Dr. Satyen Parikh, Dean, Ganpat University, Ahmedabad, India
Dr. Puspendra Singh, JKL, Jaipur, India
Dr. Aditya Patel, Ahmedabad University, Gujarat, India
Mr. Ajay Choudhary, IIT Roorkee, India

Technical Program Committee

Prof. Milan Tuba, Singidunum University, Serbia
Dr. Durgesh Kumar Mishra, Chairman, Div IV, CSI

Technical Program Committee Co-Chairs

Dr. Mahesh Bunde, Dean Research, Poornima University, Jaipur
Dr. Nilanjay Dey, Techno India College of Engineering, Kolkata, India

Advisory Committee

Shri. Nitin Kunkolienker, President, MAIT
Prof. S. Rama Rao, Goa University, Goa
Mr. P. N. Jain, Add. Sec., R&D, Government of Gujarat, India
Prof. J. Andrew Clark, Department of Computer Science, University of York, UK
Mr. Vivek Ogra, President, GESIA
Prof. Mustafizur Rahman, Endeavor Research Fellow, Australia
Dr. Kalpdram Passi, Laurentian University, ON, Canada
Mr. Chandrashekhar Sahasrabudhe, ACM India
Dr. Pawan Lingras, Saint Mary's University, Canada
Dr. S. C. Satapathy, Professor in CSE, AP, India
Mr. Niko Phillips, Active Learning, UK, India
Dr. Bhagyesh Soneji, Chairperson, ASSOCHAM Western Region

Dr. Dharm Singh, NUST, Windhoek, Namibia
Dr. Vinay Chandna, Principal, JECRC, Jaipur, India
Prof. H. R. Vishwakarma, VIT, Vellore, India

Members

Dr. Amit Kaul, UK
Prof. Babita Gupta, College of Business, California State University, California, USA
Prof. Ting-Peng Liang, National Chengchi University, Taipei, Taiwan
Prof. Anand Paul, The School of Computer Science and Engineering, South Korea
Prof. Rachid Saadane, Casablanca, Morocco
Prof. Brent Waters, University of Texas, Austin, Texas, USA
Prof. Philip Yang, PricewaterhouseCoopers, Beijing, China
Prof. H. R. Vishwakarma, VIT, Vellore, India
Prof. Martin Everett, University of Manchester, England
Dr. Rajeev Vaghmare, Principal, SITG, Ahmedabad, Gujarat, India
Prof. XiuYing Tian, Instrument Laboratory, Yangtze Delta Region Institute of Tsinghua University, Jiaxing, China
Prof. Gengshen Zhong, Jinan, Shandong, China
Prof. Mustafizur Rahman, Endeavor Research Fellow, Australia
Prof. Ernest Chulantha Kulasekere, University of Moratuwa, Sri Lanka
Prof. Subhadip Basu, Visiting Scientist, The University of Iowa, Iowa City, USA
Dr. Ashish Rastogi, Higher College of Technology, Muscat, Oman
Prof. Ahmad Al-Khasawneh, The Hashemite University, Jordan
Dr. Basant Tiwari, Professor, Ethiopia University, Ethiopia
Prof. Jean Michel Bruel, Departement Informatique IUT de Blagnac, Blagnac, France
Dr. Ramesh Thakur, DAVV, Indore, India
Prof. Shuiqing Huang, Department of Information Management, Nanjing Agricultural University, Nanjing, China
Prof. Sami Mnasri, IRIT Laboratory Toulouse, France
Dr. Krishnamachar Prasad, Department of Electrical and Electronic Engineering, Auckland, New Zealand
Prof. Foufou Sebti, Dijon Cedex, France
Dr. Haibo Tian, School of Information Science and Technology, Guangzhou, Guangdong
Mr. Vinod Thummar, SITG, Ahmedabad, Gujarat, India
Prof. Sunarto Kampus, UNY, Yogyakarta, Indonesia
Prof. Feng Jiang, Harbin Institute of Technology, China
Prof. Feng Tian, Virginia Polytechnic Institute and State University, USA
Dr. Savita Gandhi, GU, Ahmedabad, India

Prof. Abdul Rajak A. R., Department of Electronics and Communication Engineering, Birla Institute of Technology and Sciences, Abu Dhabi
Prof. Hoang Pham, Rutgers University, Piscataway, NJ, USA
Prof. Shashidhar Ram Joshi, Institute of Engineering, Pulchowk, Nepal
Prof. Abrar A. Qureshi, Ph.D., University of Virginia, USA
Dr. Aynur Unal, Stanford University, USA
Dr. Manju Mandot, JRNRV University, Udaipur, India
Dr. Rajveer Shekawat, Manipal University, India
Asst. Prof. Ngai-Man Cheung, Singapore University of Technology and Design, Singapore
Prof. J. Andrew Clark, Department of Computer Science, University of York, UK
Prof. Yun-Bae Kim, Sungkyunkwan University, South Korea
Prof. Lorne Olfman, Claremont, California, USA
Prof. Louis M. Rose, Department of Computer Science, University of York
Nedia Smairi, CNAM Laboratory, France
Dr. Vishal Gaur, Government Engineering College, Bikaner, India
Dr. Aditya Patel, Ahmedabad University, Gujarat, India
Mr. Ajay Choudhary, IIT Roorkee, India
Prof. Prasun Sinha, The Ohio State University, Columbus, OH, USA
Dr. Devesh Shrivastava, Manipal University, Jaipur, India
Prof. Xiaoyi Yu, National Laboratory of Pattern Recognition, Institute of Automation, Chinese Academy of Sciences, Beijing, China
Prof. R. S. Rao, New Delhi, India

Preface

Third International Conference on ICT for Sustainable Development (ICT4SD 2018) targeted theory, development, applications, experiences, and evaluation of interaction sciences with fellow students, researchers, and practitioners.

Conference may concern any topic within the conference scope. Workshops may be related to any topics within the conference scope. The conference is devoted to increase the understanding role of technology issues, how engineering has day by day evolved to prepare human friendly technology. The conference provided a platform for bringing forth significant research and literature across the field of ICT for sustainable development and an overview of the technologies awaiting unveiling. This interaction was the focal point for leading experts to share their insights, provide guidance, and address participant's questions and concerns.

The conference was held during August 30–31, 2018, at Hotel Vivanta by Taj, Panaji, Goa, India, organized by Global Knowledge Research Foundation, state chamber partner—Goa Chamber of Commerce & Industry, and incubation partner—Centre for Incubation and Business Acceleration, and supported by The Institution of Engineers (India)—CEDB, IE(I); Department of Electronics and IT, Ministry of Communications & Information Technology—Government of India; Asian-African Chamber of Commerce & Industry; Unified Brainz; and World Peace & Diplomacy.

Research submissions in various advanced technology areas were received, and after a rigorous peer review process with the help of program committee members and 56 external reviewers for 400 papers from 8 different countries including Algeria, USA, United Arab Emirates, Serbia, Qatar, Mauritius, Egypt, Saudi Arabia, Ethiopia, and Oman, 82 were accepted with an acceptance ratio of 0.13.

Technology is the driving force of progress in this era of globalization. Information and communication technology (ICT) has become a functional requirement for the socioeconomic growth and sustainable development of any country. The influence of information and communication technology (ICT) in shaping the process of globalization, particularly in productivity, commercial, and financial spheres, is widely recognized. The ICT sector is undergoing a revolution that has momentous implications for the current and future social and economic

situation of all the countries in the world. ICT plays a pivotal role in empowering people for self-efficacy and in understanding how it can facilitate this mission to reach out to the grassroots level. Finally, it is concluded that ICT is a significant contributor to the success of the ongoing initiative of Startup India.

In order to recognize and reward the extraordinary performance and achievements by ICT and allied sectors and promote universities, researchers, and students through their research work adapting new scientific technologies and innovations, the two-day conference had presentations from the researchers, scientists, academia, and students on the research work carried out by them in different sectors.

ICT4SD & Start up Summit was a flagship event of G R Foundation. This was the third edition. The earlier two series were a grand success with participation from various universities, academia, scientists, scholars, researchers, students, industries, stakeholders, and R&D institutions from within and outside the country. The researchers presented their research papers through presentations at the conference. All the earlier conferences witnessed the presence of more than 250 delegates and eye-catching presence from government institutions and ministries. The third edition of ICT4SD & Start up Summit along with Startup & ICT Awards focused on the new innovations using scientific technologies in the ICT sector. The conference-cum-awards marked the presence of national and international stakeholders, universities, R&D institutions, academics, students from Goa University, and BITS Pilani, Goa Chapter, representatives from union and state governments, investors, policymakers, industry leaders, trade bodies and scientific consultants, and ICT experts to share their knowledge in this area.

Belgrade, Serbia
Gwalior, India
Ahmedabad, India

Milan Tuba
Shyam Akashe
Amit Joshi

Contents

Analysis of Performance Measures of Computer Systems with Priority and Maximum Operation Time	1
Indeewar Kumar, Ashish Kumar and Monika Saini	
Novel Concept of Spelling Correction for Semantic Tourism Search Interface	13
Shilpa Laddha and Pradip M. Jawandhiya	
Cost-Effective NSX Inventory State Management in Cross-Cloud	23
Saloni Garg and Ravindra Kumar	
A Tri-band Staircase Antenna for RF Energy Harvesting	33
Aysha Munir Sheikh and Rajeev Mathur	
Aspect-Based Sentiment Analysis Using Deep Learning Convolutional Neural Network	43
Ravindra Kumar and Saloni Garg	
BrownBoost Classifier-Based Bloom Hash Data Storage for Healthcare Big Data Analytics	53
S. Arun Kumar and M. Venkatesulu	
AmbuPod a Family-Owned Social Enterprise for Inclusive Quality Health care in India	71
Pradnya Vishwas Chitrao, Pravin Kumar Bhoyar and (Brig) Rajiv Divekar	
Quality Assurance Practices and Techniques Used by QA Professional in Continuous Delivery	83
Anish Cheriyan, Raju Ramakrishna Gondkar and S. Suresh Babu	
Sensoponics: IoT-Enabled Automated Smart Irrigation and Soil Composition Monitoring System	93
Prasun Guchhait, Pranav Sehgal and Vidyadhar J. Aski	

A Novel Trust Scheme in Semantic Web	103
Suresh Kumar and Neera Chaudhary	
Random-opposition-based Learning for Computational Intelligence	111
Divya Bairathi and Dinesh Gopalani	
Secure Key Agreement Model for Group Data Sharing and Achieving Data Deduplication in Cloud Computing	121
Manav Ashok Thakur, Santosh Bari, Rutuja Deshmukh and Smita Auty	
Automated Road Surface Condition Monitoring System Using Machine Vision Technology	129
K. Sujatha, A. Ganesan, V. Karthikeyan, P. Sai Krishna, Shaik Shafiya, N. P. G. Bhavani and V. Srividhya	
Evolution of Malware and Its Detection Techniques	139
Sanjay K. Sahay, Ashu Sharma and Hemant Rathore	
Preventing Forgeries by Securing Healthcare Data Using Blockchain Technology	151
V. Vetriselvi, Sridharan Pragasheeswaran, Varatharajan Thirunavukkarasu and Amaithi Rajan Arun	
A Survey of Deep Learning Techniques for Medical Diagnosis	161
Abdul Mueed Hafiz and Ghulam Mohiuddin Bhat	
Integrated Use of AHP and GIS Techniques for Selection of Artificial Water Recharge Sites	171
Shaikh Husen, Santosh Khamitkar, Parag Bhalchandra, Preetam Tamsekar, Govind Kulkarni and Kailas Hambarde	
Social Media Data Mining Techniques: A Survey	183
Dimple Tiwari and Manoj Kumar	
Automotive Vehicle-to-Everything (V2X) Communication Using IoT	195
P. Janani, Siddhant Verma, S. Natarajan and Aditya Kumar Sinha	
Summarization of Graph Using Question Answer Approach	205
Aditi P. Deshpande and C. N. Mahender	
Analytical Assessment of Nature-Inspired Metaheuristic Algorithms to Elucidate Assembly Line Task Scheduling Problem	217
Shantanu Anandrao Lohi, Ajay A. Jaiswal, Harish V. Gorewar and Snehal A. Lohi	
#BiggBoss—Long-Run Event Detection and Sentiment Mining in Twitter	229
R. Geetha, P. Suthanthira Devi and S. Karthika	

Land Use Land Cover Change Detection Through GIS and Unsupervised Learning Technique	239
Govind Kulkarni, Aniket Muley, Nilesh Deshmukh and Parag Bhalchandra	
Innovating Digital Consumer Services in Wealth Management Ecosystem an Anthropomorphic Approach	249
Aditya Kulkarni and Swapnil Dambe	
Security Challenges and Solutions of IoT Ecosystem	259
Anshul Jain and Tanya Singh	
A Wireless Sensor System to Monitor Banana Growth Based on the Temperature	271
B. Geethanjali and B. L. Muralidhara	
User Review Classification and Star Rating Prediction by Sentimental Analysis and Machine Learning Classifiers	279
Aagam Shah, Komal Kothari, Umang Thakkar and Satvik Khara	
Veracity Analysis and Prediction in Social Big Data	289
P. Suthanthira Devi, S. Karthika, P. Venugopal and R. Geetha	
Efficient Implementation of Carry-Skip Adder Using CSMT Adder and PPA	299
S. Sridevi Sathya Priya, Benita Poulraju, B. Benita and Dharani Karanatakam	
Multispectral Satellite Image Classification Based on Bare Bone Fireworks Algorithm	305
Eva Tuba, Raka Jovanovic and Milan Tuba	
A Survey of Directory and Database Protocols for Data Extraction	315
Manav Ashok Thakur, Santosh G. Bari, Rutuja Deshmukh and Smita Auty	
Recent Trends in ICT-Enabled Renewable Energy Systems	327
Shamkumar Chavan and Mahesh Chavan	
Assessing the Smart Readiness of Local Councils in Mauritius	333
B. Gobin-Rahimbux, N. Gooda Sahib-Kaudeer, N. Chooramun, S. Cheerkoot-Jalim, M. Heenaye-Mamode Khan, Z. Cadarsaib, S. Kishnah and S. Elaheebocus	
The Economics of ‘Make in India’ Over ‘Buy (Import)’ Decision in Selected Technologies for the Indian Navy	345
Alok Bhagwat and Pradnya Vishwas Chitrao	

Naïve Bayes Classification on Student Placement Data: A Comparative Study of Data Mining Tools	363
Umang Mavani, Vivian Brian Lobo, Aditi Pednekar, Naomi Christianne Pereira, Rupesh Mishra and Nazneen Ansari	
Blockchain Technology: An Aid to the Governance of Smart Cities	373
Vishva Nitin Patel and Chhayaben Nitin Patel	
Machine Translation and Divergence Study for English–Maithili	383
Ritu Nidhi and Tanya Singh	
Detection of Liaison Between Health Outcome and Web Search	391
Sandip Roy and Amit Saha	
Wi-Fi-Based Portable Weather Station for Monitoring Temperature, Relative Humidity, Pressure, Precipitation, Wind Speed, and Direction	399
Indranil Sarkar, Bijoy Pal, Arnab Datta and Sandip Roy	
Automated Socio-psycho-economic Knowledge Behavior Classified in E-Commerce Applying Various Machine Learning Techniques	405
P. Vijayaragavan, R. Ponnusamy and M. Armuthan	
ICI Reduction by Parallel Concatenated Encoder Using Wavelet Transforms	415
Noura Ali, M. I. Youssef and I. F. Tarrad	
Sentence-Level Emotion Detection from Text Based on Semantic Rules	423
Dibyendu Seal, Uttam K. Roy and Rohini Basak	
A Real-Time Automatic Human Facial Expression Recognition System Using Deep Neural Networks	431
Surekha Samsani and Vineel Abhinav Gottala	
Ballast Water Quality Compliance Monitoring Using IoT	443
K. Komathy	
Analysis of Malignancy Using Enhanced GraphCut-Based Clustering for Diagnosis of Bone Cancer	453
B. S. Vandana, P. J. Antony and Sathyavathi R. Alva	
Personalized News Media Extraction and Archival Framework with News Ordering and Localization	463
Shine K. George, V. P. Jagathy Raj and Santhosh Kumar Gopalan	
Analysis of Transfer Characteristics of Junctionless GaAs-Nanotube MOSFET with Hafnium Oxide Dielectric	473
Raj Kumar and Arvind Kumar	

Signal Integrity Analysis for Diameter-Dependent Mixed Carbon Nanotube Bundle Interconnects	481
Vijay Rao Kumbhare, Punya Prasanna Paltani and Manoj Kumar Majumder	
Assignment Tracking on Android Platform	491
Dhriti Chakraborty and Matangini Chattopadhyay	
Empowering Textile Crafts Through the Internet of Things Technology	501
Deepshikha and Pradeep Yammiyavar	
RSA Using Montgomery Powering Ladder on Dual Core	513
Pawan Singh, Ashwani Kumar and Mohit Kumar	
Validation and Optimization of Image Compression Algorithms	521
Nikhilesh Joshi and Tanuja Sarode	
Temperature Control Using Sliding Mode Control: An Experimental Approach	531
Krupa Narwekar and V. A. Shah	
Simulation Platforms for Wireless Sensor Networks: How to Select?	539
Aarti Kochhar, Pardeep Kaur and Preeti	
Design of an Architectural Framework for the Implementation of eHealth in Mauritius	547
Sudha Cheerkoot-Jalim and Kanishka Gopal	
Sentiment Analysis on Online Product Reviews	559
Rajesh Bose, Raktim Kumar Dey, Sandip Roy and Debabrata Sarddar	
An Improved Approach to Background Removal Using Haar-Based Preprocessing for Phase Features	571
M. B. Veena and Meena Deshpande	
Artificial Neural Network-Based Crop Yield Prediction Using NDVI, SPI, VCI Feature Vectors	585
Preeti Tiwari and Piyush Shukla	
A Review on Implementation of Digital Image Watermarking Techniques Using LSB and DWT	595
Ashwani Kumar	
Time Series Forecasting Using Double Exponential Smoothing for Predicting the Major Ambient Air Pollutants	603
Rajesh Bose, Raktim Kumar Dey, Sandip Roy and Debabrata Sarddar	

Compression for DNA Sequences Using Huffman Encoding	615
Raju Bhukya, Subodh Yadav, Jitendra Kumar Sharma, Banabari lal Sharma and Arun Kumar	
Use of Clustering Sentiments for Opinion Mining: An Experimental Analysis	625
D. Veeraiah and J. Nageswara Rao	
ICT for HR in an Industrial Organisation for a Small but High-Impact Process (a Case Study of RINL, Visakhapatnam Steel Plant, India)	633
K. Satya Narayana, G. V. Ramesh and Debasish Ray	
Smart City and Challenges	643
Dinesh Kumar Saini and B. Y. Sandhiyaa	
Flow Shop Scheduling in Which Processing Time Connected with Probabilities and Job Delay Due to Maintenance for $M * N$ Machine	651
E. Janaki and A. Mohamed Ismail	
IoT-Enabled Smart Embedded System: An Innovative Way of Learning	659
Akshada Rathod, Prachi Ayare, Ramchandra Bobhate, Rajneeshkaur Sachdeo, Sambhaji Sarode and Jyoti Malhotra	
Multifactor Secure Login Using Graceful Labeled Paths	669
K. Vengata Krishnan and D. Lalitha	
Kolam Generated by Color Petri Nets	675
M. I. Mary Metilda and D. Lalitha	
Template Matching for Automatic Number Plate Recognition System with Optical Character Recognition	683
Arun Vaishnav and Manju Mandot	
An Exhaustive Study of Dominant Features for Natural Gas Consumption	695
Prabodh Kumar Pradhan, Sunil Dhal and Nilayam Kumar Kamila	
Visual Analytics Toward Prediction of Employee Erosion Through Data Science Tools	705
Priyanka Nair, Jaya Krishna and Devesh Kumar Srivastava	
Secured Forensic Framework for Various Users in the Virtualized Environment of Cloud	715
Gayatri S. Pandi and K. H. Wandra	
Document Classification Using Wikidata Properties	729
Sheeban Wasi, Madhurendra Sachan and Manuj Darbari	

Energy-Efficient Fuzzy-Logic-Based Data Aggregation in Wireless Sensor Networks	739
Sukhchandan Randhawa and Sushma Jain	
An Approach Toward More Accurate Forecasts of Air Pollution Levels Through Fog Computing and IoT	749
Bhavya Deep, Iti Mathur and Nisheeth Joshi	
Implementation of Dalal and Triggs Algorithm to Detect and Track Human and Non-Human Classifications by Using Histogram-Oriented Gradient Approach	759
Vijayalakshmi S. Katti, Sushitha S, Shweta Dhareshwar and K. Sowmya	
Safe Navigation for Elderly and Visually Impaired People Using Adhesive Tactile Walking Surface Indicators in Home Environment	771
Rajanala Vijaya Prakash and Srinath Taduri	
Extensible Attribute Similarity Data Mining for Categorical Data Streams in Web Usage Framework	779
N. Pushpalatha, S. Sai Satyanarayana Reddy and N. Subhash Chandra	
IAAS Service in the Public Domain: Impact of Various Security Components on Trust	789
Archana B. Saxena and Meenu Dave	
Serving the Dermatologists: Skin Diseases Detection	799
Savy Gulati and Rosepreet Kaur Bhogal	
A Green Computing Technique for Reducing Energy Consumption for Desktops Using Proxy Downloading	823
Meenakshi S. Arya, Ashwini Manjare, Payal Naik and Kamrul Haq Sheikh	
Enhancement of Brain MR-T1/T2 Images Using Mathematical Morphology	833
Anu Arya, Vikrant Bhateja, Mansi Nigam and Anuj Singh Bhadauria	
Author Index	841

About the Editors

Milan Tuba received his B.S. and M.S. in Mathematics, and M.S., M.Ph. and Ph.D. in Computer Science from the University of Belgrade and New York University. He was an Assistant Professor of Electrical Engineering at Cooper Union Graduate School of Engineering, New York. During that time, he was the founder and director of Microprocessor Lab and VLSI Lab, and led scientific projects. Since 1994, he has participated in the scientific projects for the Republic of Serbia's Ministry of Science. Currently he is the Vice Rector of Singidunum University, Serbia. His research interests include mathematical, queuing theory and heuristic optimizations applied to computer networks, image processing and combinatorial problems. He is the author of more than 150 scientific papers and a monograph. He has held ten plenary lectures at conferences at Harvard, Cambridge, Moscow, Paris and Istanbul. He is also a co-editor, member of the editorial board, scientific committee member and a reviewer for several international journals and conferences. He is a member of various international and scientific organizations: ACM, IEEE, AMS, SIAM and FNA.

Shyam Akashe is a Professor at ITM University, Gwalior, Madhya Pradesh, India. He completed his Ph.D. at Thapar University, Punjab and his M.Tech. in Electronics and Communication Engineering at the Institute of Technology & Management, Gwalior. He has authored 190 publications, including more than 50 papers in SCI indexed journals. His main research focus is low power system on chip (SoC) applications in which static random access memories (SRAMs) are omnipresent. He has authored two books entitled *Moore's Law Alive: Gate-All-Around (GAA) Next Generation Transistor* published by LAMBERT Academic Publishing, Germany and *Low Power High Speed CMOS Multiplexer Design* published by Nova Science Publishers, Inc., New York, USA. He has also published over 120 papers in leading national and international refereed journals of repute. Dr. Akashe has participated in numerous national and international conferences and presented over 100 papers.

Amit Joshi is a young entrepreneur and researcher who holds a B.Tech. in Information Technology and M.Tech. in Computer Science and Engineering. He pursued research in the areas of cloud computing and cryptography and has 6 years' academic and industrial experience in prestigious organizations in Udaipur and Ahmedabad. Currently, he is working as an Assistant Professor at the Department of Information Technology at Sabar Institute in Gujarat. He is an active member of ACM, CSI, AMIE, IACSIT-Singapore, IDES, ACEEE, NPA and many other professional societies. He is also Honorary Secretary of CSI Udaipur Chapter and Secretary of the ACM Udaipur Chapter. He has presented and published more than 30 papers in national and international journals as well as IEEE and ACM conferences. He has edited three books on diverse subjects including advances in open source mobile technologies, ICT for integrated rural development and ICT for competitive strategies. He has also organized more than 15 national and international conference and workshops including ICTCS 2014 in Udaipur and ACM-ICPS. He has received appreciation awards from The Institution of Engineers (India), ULC and from the SIG-WNs Computer Society of India for his contributions to society.