

Advances in Intelligent Systems and Computing 924

Sanjiv K. Bhatia
Shailesh Tiwari
Krishn K. Mishra
Munesh C. Trivedi *Editors*

Advances in Computer Communication and Computational Sciences

Proceedings of IC4S 2018

 Springer

Advances in Intelligent Systems and Computing

Volume 924

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 Hagraas, 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>

Sanjiv K. Bhatia · Shailesh Tiwari ·
Krishn K. Mishra · Munesh C. Trivedi
Editors

Advances in Computer Communication and Computational Sciences

Proceedings of IC4S 2018

 Springer

Editors

Sanjiv K. Bhatia
Department of Mathematics
and Computer Science
University of Missouri–St. Louis
St. Louis, MO, USA

Shailesh Tiwari
CSED
ABES Engineering College
Ghaziabad, Uttar Pradesh, India

Krishn K. Mishra
Department of Computer Science
and Engineering
Motilal Nehru National Institute
of Technology
Allahabad, Uttar Pradesh, India

Munesh C. Trivedi
Department of Information Technology
Rajkiya Engineering College
Azamgarh, Uttar Pradesh, India

ISSN 2194-5357 ISSN 2194-5365 (electronic)
Advances in Intelligent Systems and Computing
ISBN 978-981-13-6860-8 ISBN 978-981-13-6861-5 (eBook)
<https://doi.org/10.1007/978-981-13-6861-5>

Library of Congress Control Number: 2019932704

© Springer Nature Singapore Pte Ltd. 2019

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

Preface

IC4S is a major multidisciplinary conference organized with the objective of bringing together researchers, developers, and practitioners from academia and industry working in all areas of computer and computational sciences. It is organized specifically to help the computer industry to derive the advances of next-generation computer and communication technology. Researchers invited to speak will present the latest developments and technical solutions.

Technological developments all over the world are dependent upon globalization of various research activities. Exchange of information and innovative ideas is necessary to accelerate the development of technology. Keeping this ideology in preference, the International Conference on Computer, Communication and Computational Sciences (IC4S 2018) was organized at Mandarin Hotel Bangkok, Bangkok, Thailand, during October 20–21, 2018.

This is the third time the International Conference on Computer, Communication and Computational Sciences has been organized with a foreseen objective of enhancing the research activities at a large scale. Technical Program Committee and Advisory Board of IC4S include eminent academicians, researchers, and practitioners from abroad as well as from all over the nation.

In this book, selected manuscripts have been subdivided into various tracks named—Intelligent Hardware and Software Design, Advanced Communications, Intelligent Computing Techniques, Web and Informatics, and Intelligent Image Processing. A sincere effort has been made to make it an immense source of knowledge for all, and this book includes 64 manuscripts. The selected manuscripts went through a rigorous review process and are revised by authors after incorporating the suggestions of the reviewers.

IC4S 2018 received around 350 submissions from around 550 authors of 15 different countries such as USA, Iceland, China, Saudi Arabia, South Africa, Taiwan, Malaysia, Indonesia, and Europe. Each submission went through the plagiarism check. On the basis of plagiarism report, each submission was rigorously reviewed by at least two reviewers with an average of 2.7 per reviewer. Even some submissions have more than two reviews. On the basis of these reviews,

64 high-quality papers were selected for publication in this proceedings volume, with an acceptance rate of 18.28%.

We are thankful to the keynote speakers—Prof. Raija Halonen, University of Oulu, Finland; Dr. K. K. Mishra, University of Missouri, St. Louis, USA; Mr. Aninda Bose, Senior Editor, Springer Nature, to enlighten the participants with their knowledge and insights. We are also thankful to delegates and the authors for their participation and their interest in IC4S 2018 as a platform to share their ideas and innovation. We are also thankful to Prof. Dr. Janusz Kacprzyk, Series Editor, AISC, Springer, for providing guidance and support. Also, we extend our heartfelt gratitude to the reviewers and Technical Program Committee members for showing their concern and efforts in the review process. We are indeed thankful to everyone directly or indirectly associated with the Organizing Committee of the conference, leading it toward the success.

Although utmost care has been taken in compilation and editing, a few errors may still occur. We request the participants to bear with such errors and lapses (if any). We wish you all the best.

Bangkok, Thailand

Organizing Committee
IC4S 2018

About This Book

With the advent of technology, intelligent and soft computing techniques came into existence with a wide scope of implementation in engineering sciences. Nowadays, technology is changing with a speedy pace and innovative proposals that solve the engineering problems intelligently are gaining popularity and advantages over the conventional solutions to these problems. It is very important for the research community to track the latest advancements in the field of computer sciences. Keeping this ideology in preference, this book includes the insights that reflect the ‘Advances in Computer and Computational Sciences’ from upcoming researchers and leading academicians across the globe. It contains the high-quality peer-reviewed papers of ‘International Conference on Computer, Communication and Computational Sciences’ (IC4S 2018), held during October 20–21, 2018, at Mandarin Hotel Bangkok, Bangkok, Thailand. These papers are arranged in the form of chapters. The content of this book is divided into five broader tracks that cover a variety of topics. These tracks are: *Intelligent Hardware and Software Design, Advanced Communications, Intelligent Computing Technologies, Web and Informatics, and Intelligent Image Processing*. This book helps the prospective readers from computer and communication industry and academia to derive the immediate surroundings’ developments in the field of communication and computer sciences and shape them into real-life applications.

Contents

Part I Intelligent Hardware and Software Design	
Software Architecture Decision-Making Practices and Recommendations	3
Md. Monzur Morshed, Mahady Hasan and M. Rokonuzzaman	
Abstraction in Modeling and Programming with Associations: Instantiation, Composition and Inheritance	11
Bent Bruun Kristensen	
Ensuring Compliance with Sprint Requirements in SCRUM	33
Manuel Pastrana, Hugo Ordóñez, Ana Rojas and Armando Ordoñez	
Remote Collaborative Live Coding in SuperCollider-Based Environments via Open Sound Control Proxy	47
Poonna Yospanya	
A Collaborative Model for Customer Retention on User Service Experience	55
Pushpa Singh and Vishwas Agrawal	
Smart Services for Smart Cities: New Delhi Versus Jaipur	65
Devesh Kumar Srivastava	
Global Terrorism Predictive—Analysis	77
Sandeep Chaurasia, Vinayak Warikoo and Shanu Khan	
Part II Advanced Communications	
Effect of Constraint Variation on the Efficiency of Protocols Under Realistic Environment	89
Prem Chand Vashist, Ashish Tripathi and Pushpa Choudhary	

Performance Evaluation of OLSR-MD Routing Protocol for MANETS	101
Rachna Jain and Indu Kashyap	
Privacy Attack Modeling and Risk Assessment Method for Name Data Networking	109
Vishwa Pratap Singh and R. L. Ujjwal	
Analysis of Classification Methods Based on Radio Frequency Fingerprint for Zigbee Devices	121
Jijun Wang, Ling Zhuang, Weihua Cheng, Chao Xu, Xiaohu Wu and Zheyang Zhang	
To Identify Visible or Non-visible-Based Vehicular Ad Hoc Networks Using Proposed BBICR Technique	133
Kallam Suresh, Patan Rizwan, Balusamy Balamurugan, M. Rajasekharababu and S. Sreeji	
Energy Efficient Improved SEP for Routing in Wireless Sensor Networks	143
Deepak Kumar Sharma, Siddhant Bagga and Rishabh Rastogi	
Part III Intelligent Computing Technologies	
SVM Hyperparameter Optimization Using a Genetic Algorithm for Rub-Impact Fault Diagnosis	155
Alexander Prosvirin, Bach Phi Duong and Jong-Myon Kim	
Adaptive Credit Card Fraud Detection Techniques Based on Feature Selection Method	167
Ajeet Singh and Anurag Jain	
Emousic: Emotion and Activity-Based Music Player Using Machine Learning	179
Pranav Sarda, Sushmita Halasawade, Anuja Padmawar and Jagannath Aghav	
Extra-Tree Classifier with Metaheuristics Approach for Email Classification	189
Aakanksha Sharaff and Harshil Gupta	
A Parametric Method for Knowledge Measure of Intuitionistic Fuzzy Sets	199
Zhen-hua Zhang, Shen-guo Yuan, Chao Ma, Jin-hui Xu and Jing Zhang	
Hybrid PPSO Algorithm for Scheduling Complex Applications in IoT	211
Komal Middha and Amandeep Verma	

Skyline Probabilities with Range Query on Uncertain Dimensions 225
 Nurul Husna Mohd Saad, Hamidah Ibrahim, Fatimah Sidi
 and Razali Yaakob

**KDD-Based Decision Making: A Conceptual Framework Model
 for Maternal Health and Child Immunization Databases** 243
 Sourabh Shastri and Vibhakar Mansotra

**An Efficient Detection of Malware by Naive Bayes Classifier
 Using GPGPU** 255
 Sanjay K. Sahay and Mayank Chaudhari

**Content-Based Audio Classification and Retrieval Using
 Segmentation, Feature Extraction and Neural Network Approach** 263
 Nilesh M. Patil and Milind U. Nemade

**Information Extraction from Natural Language Using Universal
 Networking Language** 283
 Alope Kumar Saha, M. F. Mridha, Jahir Ibna Rafiq and Jugal K. Das

On the Knowledge-Based Dynamic Fuzzy Sets 293
 Rolly Intan, Siana Halim and Lily Puspa Dewi

**Analysis and Discussion of Radar Construction Problems
 with Greedy Algorithm** 303
 Wenrong Jiang

Multilevel ML Assistance to High Efficiency Video Coding 313
 Chhaya Shishir Pawar and SudhirKumar D. Sawarkar

**Recognizing Hand-Woven Fabric Pattern Designs
 Based on Deep Learning** 325
 Wichai Puarungroj and Narong Boonsirisumpun

**Learning Curve as a Knowledge-Based Dynamic Fuzzy Set:
 A Markov Process Model** 337
 Siana Halim, Rolly Intan and Lily Puspa Dewi

**Human Body Shape Clustering for Apparel Industry
 Using PCA-Based Probabilistic Neural Network** 343
 YingMei Xing, ZhuJun Wang, JianPing Wang, Yan Kan, Na Zhang
 and XuMan Shi

Predicting the Outcome of H-1B Visa Eligibility 355
 Prateek and Shweta Karun

Dynamic Neural Network Model of Speech Perception 365
 Marius Crisan

Leakage Detection of Water-Induced Pipelines Using Hybrid Features and Support Vector Machines	377
Thang Bui Quy and Jong-Myon Kim	
Large-Scale Meta-Analysis of Genes Encoding Pattern in Wilson’s Disease	389
Diganta Misra, Anurag Tiwari and Amrita Chaturvedi	
A Dynamic Weight Grasshopper Optimization Algorithm with Random Jumping	401
Ran Zhao, Hong Ni, Hangwei Feng and Xiaoyong Zhu	
Simulation Model and Scenario to Increase Corn Farmers’ Profitability	415
Erma Suryani, Rully Agus Hendrawan, Lukman Junaedi and Lily Puspa Dewi	
Comparison of Bayesian Networks for Diabetes Prediction	425
Kanogkan Leerojanaprapa and Kittiwat Sirikasemsuk	
Part IV Web and Informatics	
A Survey on the Detection of Android Malicious Apps	437
Sanjay K. Sahay and Ashu Sharma	
A Survey on Visualization Techniques Used for Big Data Analytics	447
Sumit Hirve and C. H. Pradeep Reddy	
User Behaviour-Based Mobile Authentication System	461
Adnan Bin Amanat Ali, Vasaki Ponnusamay and Anbuselvan Sangodiah	
Cyber Social Media Analytics and Issues: A Pragmatic Approach for Twitter Sentiment Analysis	473
Sanur Sharma and Anurag Jain	
Internet of Things for Epidemic Detection: A Critical Review	485
S. A. D. S. Kaushalya, K. A. D. T. Kulawansa and M. F. M. Firdhous	
Semantic Recognition of Web Structure to Retrieve Relevant Documents from Google by Formulating Index Term	497
Jinat Ara and Hanif Bhuiyan	
An Effective and Cost-Based Framework for a Qualitative Hybrid Data Deduplication	511
Charles R. Haruna, MengShu Hou, Moses J. Eghan, Michael Y. Kpiebaareh and Lawrence Tandoh	

Ontology-Based Natural Language Processing for Thai Herbs and Thai Traditional Medicine Recommendation System Supporting Health Care and Treatments (THMRS) 521
 Akkasit Sittisaman and Naruepon Panawong

Tourism Web Filtering and Analysis Using Naïve Bay with Boundary Values and Text Mining 535
 Naruepon Panawong and Akkasit Sittisaman

One Novel Word Segmentation Method Based on N-Shortest Path in Vietnamese 549
 Xiaohua Ke, Haijiao Luo, JiHua Chen, Ruibin Huang and Jinwen Lai

The Analysis of Student Performance Using Data Mining 559
 Leo Willyanto Santoso and Yulia

Efficient CP-ABE Scheme for IoT CCN Based on ROBDD 575
 Eric Affum, Xiasong Zhang, Xiaofen Wang and John Bosco Ansuura

Authority-Based Ranking in Propaganda Summary Generation Considering Values 591
 Kun Lang, Wei Han, Tong Li and Zhi Cai

A Concept to Improve Care for People with Dementia 603
 Mary Sio Lai Karppinen, Jori Karppinen and Raija Halonen

Analysis of Centrality Concepts Applied to Real-World Big Graph Data 619
 Soyeon Oh, Kyeongjoo Kim and Minsoo Lee

How Does Grooming Fit into Social Engineering? 629
 Patricio Zambrano, Jenny Torres and Pamela Flores

Part V Intelligent Image Processing

Towards Improving Performance of Sigma Filter 643
 Mayank Tiwari, Subir Singh Lamba and Bhupendra Gupta

Video-Based Facial Expression Recognition Using a Deep Learning Approach 653
 Mahesh Jangid, Pranjul Paharia and Sumit Srivastava

Zernike Moment-Based Facial Expression Recognition Using Two-Staged Hidden Markov Model 661
 Mayur Rahul, Rati Shukla, Dinesh Kumar Yadav and Vikash Yadav

Automated Facial Micro-expression Recognition Using Local Binary Patterns on Three Orthogonal Planes with Boosted Classifiers: A Survey 671
 Kennedy Chengeta

Identification of Emotional States and Their Potential 687
Jan Francisti and Zoltan Balogh

**Effects of a Spectral Window on Frequency Domain
HRV Parameters** 697
Jeom Keun Kim and Jae Mok Ahn

Effects of Heart Rate on Results of HRV Analysis 711
Jae Mok Ahn and Jeom Keun Kim

Review of Camera Calibration Algorithms..... 723
Li Long and Shan Dongri

Breast Cancer Prediction: Importance of Feature Selection 733
Prateek

**Enactment of LDPC Code Over DVB-S2 Link System
for BER Analysis Using MATLAB** 743
Shariq Siraj Uddin Ghouri, Sajid Saleem and Syed Sajjad Haider Zaidi

Author Index..... 751

About the Editors

Sanjiv K. Bhatia received his Ph.D. in Computer Science from the University of Nebraska, Lincoln, USA in 1991. He presently works as a Professor and Graduate Director (Computer Science) at the University of Missouri, St.Louis, USA. His primary areas of research include image databases, digital image processing, and computer vision. In addition to publishing over 40 articles in these areas, he has consulted extensively with industry for commercial and military applications of computer vision. He is an expert on system programming and has worked on real-time and embedded applications. He has taught a broad range of courses in computer science and was the recipient of the Chancellor's Award for Excellence in Teaching in 2015. He is a senior member of ACM.

Shailesh Tiwari currently works as a Professor at the Department of Computer Science and Engineering, ABES Engineering College, Ghaziabad, India. He is an alumnus of Motilal Nehru National Institute of Technology Allahabad, India. His primary areas of research are software testing, implementation of optimization algorithms and machine learning techniques in software engineering. He has authored more than 50 publications in international journals and the proceedings of leading international conferences. He also serves as an editor for various Scopus, SCI and E-SCI-indexed journals and has organized several international conferences under the banner of the IEEE and Springer. He is a senior member of the IEEE and a member of the IEEE Computer Society.

Krishn K. Mishra is currently working as an Assistant Professor at the Department of Computer Science and Engineering, Motilal Nehru National Institute of Technology Allahabad, India. He has also been a Visiting Faculty at the Department of Mathematics and Computer Science, University of Missouri, St. Louis, USA. His primary areas of research include evolutionary algorithms, optimization techniques and design, and analysis of algorithms. He has also authored more than 50 publications in international journals and the proceedings of

leading international conferences. He currently serves as a program committee member of several conferences and an editor for various Scopus and SCI-indexed journals.

Munesh C. Trivedi is currently an Associate Professor at the Department of Information Technology, Rajkiya Engineering College, Azamgarh, India and also Associate Dean-UG Programs, Dr. APJ Abdul Kalam Technical University, Lucknow. He has published 20 textbooks and 95 research papers in various international journals and in the proceedings of leading international conferences. He has received young scientist and numerous other awards from different national and international forums. He currently serves on the review panel of the IEEE Computer Society, International Journal of Network Security, and Computer & Education (Elsevier). He is a member of the executive committee of the IEEE UP Section, IEEE India Council and also the IEEE Asia Pacific Region 10.