

Studies in Computational Intelligence

Volume 784

Series Editor

Janusz Kacprzyk, Polish Academy of Sciences, Warsaw, Poland

The series “Studies in Computational Intelligence” (SCI) publishes new developments and advances in the various areas of computational intelligence—quickly and with a high quality. The intent is to cover the theory, applications, and design methods of computational intelligence, as embedded in the fields of engineering, computer science, physics and life sciences, as well as the methodologies behind them. The series contains monographs, lecture notes and edited volumes in computational intelligence spanning the areas of neural networks, connectionist systems, genetic algorithms, evolutionary computation, artificial intelligence, cellular automata, self-organizing systems, soft computing, fuzzy systems, and hybrid intelligent systems. Of particular value to both the contributors and the readership are the short publication timeframe and the world-wide distribution, which enable both wide and rapid dissemination of research output.

The books of this series are submitted to indexing to Web of Science, EI-Compendex, DBLP, SCOPUS, Google Scholar and Springerlink.

More information about this series at <http://www.springer.com/series/7092>

J. K. Mandal · Devadutta Sinha
Editors

Intelligent Computing Paradigm: Recent Trends

 Springer

Editors

J. K. Mandal
Department of Computer Science
and Engineering
University of Kalyani
Kalyani, West Bengal, India

Devadutta Sinha
Department of Computer Science
and Engineering
University of Calcutta
Kolkata, India

ISSN 1860-949X ISSN 1860-9503 (electronic)
Studies in Computational Intelligence
ISBN 978-981-13-7333-6 ISBN 978-981-13-7334-3 (eBook)
<https://doi.org/10.1007/978-981-13-7334-3>

Library of Congress Control Number: 2019934794

© 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

Preface

This volume entitled “Intelligent Computing Paradigm: Recent Trends” is an extended version of some selected papers from CSI-2017 along with papers submitted independently by the authors against the call for papers. There are eight chapters in this volume: The first chapter deals with the classification of library resources based on the recommender system; the second chapter deals with the prospect of disease prediction using reliability. The second and fourth chapters deal with wireless sensor network for studying the behavioral change and clustering of nodes. The third chapter deals with AI-based disease prediction, whereas the fifth chapter deals with product prediction and recommendation. The sixth chapter deals with reliability and area minimization of VLSI power grid network. The seventh chapter deals with the detection of forest cover changes from remote sensing data. The last chapter deals with the identification of malignancy from cytological images.

The chapters were reviewed as per norms of Studies in Computational Intelligence book series. Based on comments of the reviewers, the chapters were modified by the authors and the modified chapters are examined for incorporation of the same. Finally, eight chapters are selected for publication in this special issue Intelligent Computing Paradigm: Recent Trends under the book series Studies in Computational Intelligence, Springer.

On behalf of the editors, we would like to express our thanks to the authors for sending chapters into this special issue. We would like to express our sincere gratitude to the reviewers for reviewing the chapters.

Hope this special issue will be a good material on the state-of-the-art research.

Kalyani, West Bengal, India

Jyotsna Kumar Mandal
University of Kalyani

Kolkata, West Bengal, India
April 2019

Devadatta Sinha
Calcutta University

Contents

Improved Hybrid Approach of Filtering Using Classified Library Resources in Recommender System	1
Snehalata B. Shirude and Satish R. Kolhe	
A Study on Collapse Time Analysis of Behaviorally Changing Nodes in Static Wireless Sensor Network	11
Sudakshina Dasgupta and Paramartha Dutta	
Artificial Intelligent Reliable Doctor (AIRDr.): Prospect of Disease Prediction Using Reliability	21
Sumit Das, Manas Kumar Sanyal and Debamoy Datta	
Bacterial Foraging Optimization-Based Clustering in Wireless Sensor Network by Preventing Left-Out Nodes	43
S. R. Deepa and D. Rekha	
Product Prediction and Recommendation in E-Commerce Using Collaborative Filtering and Artificial Neural Networks: A Hybrid Approach	59
Soma Bandyopadhyay and S. S. Thakur	
PGRDP: Reliability, Delay, and Power-Aware Area Minimization of Large-Scale VLSI Power Grid Network Using Cooperative Coevolution	69
Sukanta Dey, Sukumar Nandi and Gaurav Trivedi	
Forest Cover Change Analysis in Sundarban Delta Using Remote Sensing Data and GIS	85
K. Kundu, P. Halder and J. K. Mandal	
Identification of Malignancy from Cytological Images Based on Superpixel and Convolutional Neural Networks	103
Shyamali Mitra, Soumyajyoti Dey, Nibaran Das, Sukanta Chakrabarty, Mita Nasipuri and Mrinal Kanti Naskar	

About the Editors

J. K. Mandal is former Dean of the Faculty of Engineering, Technology and Management, and Senior Professor at the Department of Computer Science & Engineering, University of Kalyani, India. He has obtained his Ph.D. (Eng.) from Jadavpur University. Professor Mandal has co-authored six books: *Algorithmic Design of Compression Schemes and Correction Techniques—A Practical Approach*; *Symmetric Encryption—Algorithm, Analysis and Applications: Low Cost-based Security*; *Steganographic Techniques and Application in Document Authentication—An Algorithmic Approach*; *Optimization-based Filtering of Random Valued Impulses—An Algorithmic Approach*; and *Artificial Neural Network Guided Secured Communication Techniques: A Practical Approach*; all published by Lambert Academic Publishing, Germany. He has also authored more than 350 papers on a wide range of topics in international journals and proceedings. Twenty-three scholars awarded Ph.D. Degree under his supervision. His profile is included in the 31st edition of *Marque's World Who's Who* published in 2013. Government of West Bengal, India conferred him 'Siksha Ratna' award as an outstanding teacher in 2018. His areas of research include coding theory, data and network security, remote sensing and GIS-based applications, data compression, error correction, visual cryptography and steganography, distributed and shared memory parallel programming. He is Fellow of Institution of Electronics and Telecommunication Engineers, and Members of IEEE, ACM, and Computer Society of India.

Prof. Dr. Devadutta Sinha graduated with honors in Mathematics from Presidency College and completed his postgraduation in Applied Mathematics and then in Computer Science. He completed his Ph.D. in the field of Computer Science at Jadavpur University in 1985. He started his teaching career at the Department of Computer Engineering at BIT Mesra Ranchi, then at Jadavpur University and Calcutta University, where he was a Professor at the Department of Computer Science and Engineering. He also served as Head of the Department of Computer Science and Engineering, and Convener of the Ph.D. Committee in Computer Science and Engineering and in Information Technology at the University of

Calcutta. He also served as Vice-Chairman of the Research Committee in Computer Science and Engineering, West Bengal University of Technology. During his career, he has written a number of research papers in national and international journals and conference proceedings. He has also written a number of expository articles in periodicals, books and monographs. His research interests include software engineering, parallel and distributed algorithms, bioinformatics, computational Intelligence, computer education, mathematical ecology and networking. He has total teaching/research experience of more than 38 years. He was also on the editorial boards of various journals and conference proceedings and served in different capacities in the program and organizing committees of several national and international conferences. He was Sectional President, Section of Computer Science, Indian Science Congress Association for the year 1993–94. He is an active member of a number of academic bodies in various institutions. He is a fellow and senior life member of CSI and has been involved in different activities including organization of different computer/IT courses. He is also a Computer Society of India Distinguished Speaker.