

Advances in
**Energy Aware Computing
and Communication Systems**



**Harinder Singh
Jimson Mathew
Rakesh K. Bajaj
Mahesh P.**



ADVANCES IN ENERGY AWARE COMPUTING AND COMMUNICATION SYSTEMS

ICECCS – 2013

Edited by

Harinder Singh

*Department of Mathematics
Jaypee University of Information Technology, Waknaghat
Solan, H.P., INDIA*

Jimson Mathew

*Department of Computer Science
University of Bristol, Bristol, BS8 1UB
United Kingdom*

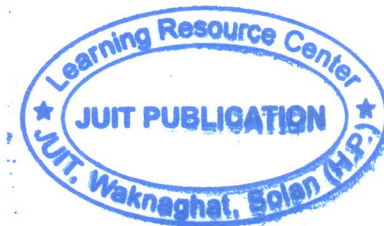
Rakesh Kumar Bajaj

*Department of Mathematics
Jaypee University of Information Technology, Waknaghat
Solan, H.P., INDIA*

Mahesh Poolakkaparambil

*Mettler Toledo GmbH
An der Langwies 1C
Wallbach, Germany*

**Mc
Graw
Hill
Education**



McGraw Hill Education (India) Private Limited

NEW DELHI

McGraw Hill Education Offices

New Delhi New York St Louis San Francisco Auckland Bogotá Caracas
Kuala Lumpur Lisbon London Madrid Mexico City Milan Montreal
San Juan Santiago Singapore Sydney Tokyo Toronto



McGraw Hill Education (India) Private Limited

Published by McGraw Hill Education (India) Private Limited,
P-24, Green Park Extension, New Delhi 110 016.

Advances in Energy Aware Computing and Communication Systems

Copyright © 2013, by McGraw Hill Education (India) Private Limited.

No part of this publication may be reproduced or distributed in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise or stored in a database or retrieval system without the prior written permission of the publishers. The program listing (if any) may be entered, stored and executed in a computer system, but they may not be reproduced for publication.

This edition can be exported from India only by the publishers,
McGraw Hill Education (India) Private Limited.

ISBN (13): 978-9-35-134332-5

ISBN (10): 9-35-134332-4

Vice President and Managing Director: *Ajay Shukla*

Publishing Manager—Professional: *Mitadru Basu*

Editorial Researcher—Science, Technology & Computing: *Irene Rajalingam*

Manager—Production: *Sohan Gaur*

DGM—Sales and Business Development—Professional: *S Girish*

Deputy Marketing Manager—Science, Technology & Computing: *Rekha Dhyani*

General Manager—Production: *Rajendra P. Ghansela*

Manager—Production: *Reji Kumar*

Information contained in this work has been obtained by McGraw Hill Education (India), from sources believed to be reliable. However, neither McGraw Hill Education (India) nor its authors guarantee the accuracy or completeness of any information published herein, and neither McGraw Hill Education (India) nor its authors shall be responsible for any errors, omissions, or damages arising out of use of this information. This work is published with the understanding that McGraw Hill Education (India) and its authors are supplying information but are not attempting to render engineering or other professional services. If such services are required, the assistance of an appropriate professional should be sought.

Typeset at Text-o-Graphics, B-1/56, Aravali Apartment, Sector-34, Noida 201 301, and printed at
Sanat Printers, 312 EPIP, HSIDC, Kundli, Sonapat, Haryana.

Cover Printer: Sanat Printers

Cover Designer: Kapil Gupta

Program Committee

John Chiverton,	Rangsit University, Patumthani Thailand
Martinez-Carranza Jose	University of Bristol, UK
Chirag Warty	University of Columbia, USA
Sunil Rana	University of Bristol, UK,
Dwarikanath Mahapatra	ETH Zurich, Switzerland
Matija Dzanko	FER, University of Zagreb, Croatia
Chirag Warty	Columbia University, USA
Amandeep S. Sidhu	Curtin University, Sarawak Malaysia
Chuang Ma	National Tsing Hua University, Taiwan,
Subhasis	Banarjee, IIT, Delhi
Parashar Karthick	Imperial College, UK
Sanghoon Kwak	Sogang University, Korea
Bharat Joshi	University of North Carolina Charlotte, USA
Wooi Haw	Tan. Multimedia University, Malaysia
Deepti Das	RSET, India,
Pedro Real	University of Seville, Spain
Mohamed	Ezzat El-Hadedy Aly, Atmel, Norway
Subhasis Bhattacharjee	University of Bristol, UK
Nitin Gupta	Jaypee University of Information Technology, India
Mythili P.	Cochin University of Science and Technology, India
Jyoti Prakash Singh	National Institute of Technology Patna, India
Tanmay De	National Institute of Technology Durgapur, India
Andrea Manuzzato	ST Microelectronics, Italy
Jyotsna Kumar	Mandal University of Kalyani, India
AndreiMajidian	British Telecom, UK
Mohammad Hosseinabady	Queen's University Belfast, UK
Daniel Díaz Pernil,	University of Seville, Spain
Vishram Mishra	Nanyang Technological University, Singapore
Deepa Sankar	Cochin University of Science and Technology, India
Mini Ulanat	Cochin University of Science and Technology, India
NarendarMadhavan	Nanyang Technological University, Singapore
Susanna Spinsante	Univpm, Italy
Priestly Shan	SJCET, Kerala India,
Esam Ali	CommScope, DCCS Group
Vikas	Gupta V. C. E. T., Vasai, India,
Seok-Bum	Ko, usask, Canada
Sadanandan K.	Tech. Mahendra, India
NarasimhaMurthy	Indian Institute of Technology Guwahati

Program Committee

KayunChantarasathaporn	Rangsit University, Patumthani Thailand
Florin Balasa	American Univesity Cairo
Vincent George	RIT, India
Anirban De	Variable Energy Cyclotron Centre, India
R. Logeswaran	Multimedia University, Malaysia
Smitha KavallurPisharath	Nanyang Technological University, Singapore
Kavitha Thomas	Nanyang Technological University, Singapore
Indrajit Banerjee	Bengal Engineering & Science University, India
MaheshPoolakkaparambil	Oxford Brookes University, UK
AmiyaPatanaik	Nanyang Technological University, Singapore
AnasAbu Taleb	Jordan University
Akhil Garg	Nanyang Technological University, Singapore
Navin Michael	A star, Singapore,
Mourad Bouache	Illinois University, USA
Ashutosh KumarSingh	Curtin University Malaysia
Biplab KSikdar	Bengal Engineering & Science University, Shibpur
K. P. Ray	SAMEER, India
Feng Chaochao	National University of Defense Technology, China
Chandra Sekaran S	NITK, India
Kilari	Veera Swamy, QIS College of Engineering and Tech. India
Bijoy Antony Jose	Intel Corporation, USA
Hamid Zarandi	Amirkabir, University of Technology, Iran
Sumit Ahuja	INTEL Corporation, Santa Clara, USA
Chilukuri M. V.,	Smart Grid Consultant, India
Mohammad Kakoee	Qualcomm, USA
Khaled Elmahgoub	University of Mississippi, USA
Amit	Acharya IIT, Hyderabad, India
Archan	Bhattacharya Sciformix, Pune, India
Behrouz	Yazdani Polytechnic University of Turin, Italy
Bhupendra	Pathak JUIT, Wagnaghat, India
C Rout	JUIT, Wagnaghat, India
Diapnaker Sengupta	JUIT, Wagnaghat, India
Divakar Yadav	Jaypee Institute of IT University
Gaurav Garg	IIM, Lucknow, India
Ghanshyam Singh	JUIT, Wagnaghat, India
Hemraj Saini	JUIT, Wagnaghat, India
Jose Martinez-Carranza	University of Bristol, UK
Karanjeet Singh	JUIT, Wagnaghat, India
Karthick Parashar	Imperial College, London
Kilari Veera Swamy	QIS College of Engg and Tech, Ongole, India
Manish Tiwari	Rajdhani College, Jaipur, India
Marwa Ezzat	Mansoura University, Egypt
Massoud Mokhtarpour	University of Southampton, UK

Matija Dzanko	University of Zagreb, Croatia
Mohamad Imran Bandan,	University of Bristol, UK
Mohamed El-Hadedy	ATMEL Norway
Muhammad Sheikh Sadi	KUET, Khulna, Bangladesh
Nitin	JUIT, Wagnaghat, India
Nitin Rakesh	JUIT, Wagnaghat, India
Nitin Gupta	IIT, Kharagpur, India
Pardeep Kumar	JUIT, Wagnaghat, India
Pooja Jain	JUIT, Wagnaghat, India
Pradeep Pandey	JUIT, Wagnaghat, India
Pradeep Gupta	JUIT, Wagnaghat, India
Prasun G.	BESU, Shibpur, India
Priestly Shan	SJCET, Palai, Kerala, India
Rajeev Agrawal	G. L. Bajaj Inst of Tech.and Mgmt, India
Rajesh Siddavatam	JUIT, Wagnaghat, India
Ravindara Bhatt	JUIT, Wagnaghat, India
Sambit Bakshi,NIT, Rourkela, India	
Sanghoon Kwak	Sogang University, Korea
Shri Ram	JUIT, Wagnaghat, India
Shruti Jain	JUIT, Wagnaghat, India
Simran Tandon	JUIT, Wagnaghat, India
Sudhir Syal	JUIT, Wagnaghat, India
Sudip Roy	IIT, Kharagpur, India
Sujoy Bhattacharya	IIT, Kharagpur, India
Sundarapandian, Vaidyanathan	Vel Tech University, India
Tirthraj Singh	JUIT, Wagnaghat, India
Vikas Saxena	JIIT, Noida, India
Vivek Sehgal	JUIT, Wagnaghat, India

Organizing Committee

Chief Patron

Shri Jaiprakash Gaur, Founder Chairman, Jaypee Group, Founder Pro-Chancellor,
Jaypee University of Information Technology (JUIT), India

Patron

Shri Manoj Gaur, Executive Chairman, Jaypee Group, Pro-Chancellor,
Jaypee University of Information Technology (JUIT), India

Local Advisory Committee

Dr. Yaj Medury, COO-Jaypee Education System, India
Brig. (Retd.) Balbir Singh, The Director, JUIT, Wagnaghat, India

General Chairs

Prof. Harinder Singh, JUIT, Wagnaghat, India
Prof. Dhiraj K. Pradhan, University of Bristol, UK

Program Chairs

Dr. Jimson Mathew, University of Bristol, UK
Dr. Rakesh Kumar Bajaj, JUIT, Wagnaghat, India

Organizing Chair

Dr. Rakesh Kumar Bajaj, JUIT, Wagnaghat, India

Publication Chairs

Dr. Mahesh P., Mettler Toledo GmbH, Germany
Dr. Babita Roslind Jose, CUSAT, India

Finance Chairs

Brig. (Retd.) Balbir Singh, The Director, JUIT, Wagnaghat, India

Publicity Chairs

Dr. Shri Ram, Learning Resource Centre, JUIT, Wagnaghat, India
Dr. Renji Remesan, University of Cranfield, UK

Contents

<i>Preface</i>	v
<i>Program Committee</i>	vii
<i>Organizing Committee</i>	x
1. Eco-friendly Sample Preparation with Concentration Gradient on a Digital Microfluidic Biochip <i>Sukanta Bhattacharjee, Ansuman Banerjee, Tsung-Yi Ho, Krishnendu Chakrabarty, and Bhargab B. Bhattacharya</i>	1
2. Energy and Traffic Load Aware AODV Routing for Wireless AD HOC Networks <i>Shiva Prakash, J.P. Saini, and S.C. Gupta</i>	12
3. Performance Evaluation of Parallel Implementation of NW Algorithm Using OpenMPI and OpenMP/MPI <i>D.D. Shrimankar and S.R. Sathe</i>	22
4. Networks-on-Chip for Energy Efficient Real Time Biomedical Signals Data Acquisition <i>Vivek Kumar Sehgal</i>	40
5. Delay Constraint Energy Efficient Routing Using Multi-objective Genetic Algorithm in Wireless Sensor Networks <i>Suneet K. Gupta, Pratyay Kuila, and Prasanta K. Jana</i>	50
6. Combined Electroosmosis-Pressure Driven Flow in a Microchannel with Nonhomogeneous Surface Potential <i>Subrata Bera and Somnath Bhattacharyya</i>	60
7. Study of Maximum Local Temperature Rise and Hotspots Distribution in a Human Head for GSM900 Mobile Phone <i>Faruk Ali, Rashmi Ranjan Sahoo, and Sudhabindu Ray</i>	70
8. Performance of Dual SC Receiver over TWDP Fading Channel <i>Shashank Awasthi and Aheibam Dinamani Singh</i>	79
9. Fusion of Mamdani Fuzzy Inference System and Genetic Algorithm for Assessing Morningness <i>Animesh Biswas, Debasish Majumder, and Subhashis Sahu</i>	88
10. An Energy Efficient Hybrid Proxy Cache-Prefetch Model for Web Optimization <i>Sirshendu Sekhar Ghosh and Aruna Jain</i>	98
11. Digitally Controlled Current-Mode Multifunctional Biquadratic Filter <i>Deepesh Arora, Rishabh Kumar, and Ale Imran</i>	108
12. PSOIIW-Based Sidelobe Level Reduction in Time Modulated Linear Antenna Arrays <i>Gopi Ram Hardel, Durbadal Mandal, Sakti Prasad Ghoshal, and Rajib Kar</i>	118
13. Simplified Implementation of Sphere Decoding Algorithms for MIMO Wireless Communication System <i>Gajanan R. Patil and Vishwanath K. Kokate</i>	128

14.	EDCP: Efficient Distributed Clustering Protocol for Large-Scale Wireless Sensor Networks <i>Tarachand Amgoth and Prasanta K. Jana</i>	138
15.	Optimal Thinning of a Large Concentric Circular Antenna Array Using Novel Particle Swarm Optimization <i>Durbadal Mandal, Rajesh Bera, Sakti Prasad Ghoshal, and Rajib Kar</i>	150
16.	A Novel Edge Preserving Algorithm for Noise Removal in Image Restoration <i>P. Syamala Jaya Sree, Kireeti Bodduna, Rajesh Siddavatam, and S.P. Ghrera</i>	160
17.	An Unsupervised Change Detection Method for Satellite Images Using PCA and SOM Neural Network <i>Krishna Kant Singh, Priyanka Khandelwal, and Akansha Mehrotra</i>	169
18.	Image Compression Using Pseudoskeleton Approximation <i>Theeda Prasad and Naraparaju Kishore Kumar</i>	179
19.	Cascaded Correlation Neural Network Based Tumor Detection in MRI Brain Images <i>V. Amsaveni, N. Albert Singh, and J. Dheebea</i>	192
20.	Qualitative Evaluation and Improvement Suggestions for eBooks Using Text Analytics Algorithms <i>Mahima Relan, Swati Khurana, and Vivek Kumar Singh</i>	202
21.	Fuzzy Logic Based Adaptive Hysteresis Controller with Wavelet Based Reference Current Computation for Shunt Active Power Filter <i>P. Rathika and D. Devaraj</i>	214
22.	Common Fixed Point Theorem on Fuzzy Metric Spaces Using Biased Maps of Type (RM) <i>Vishal Gupta, Ashima Kanwar, and S.B. Singh</i>	227
23.	Interval-Valued Intuitionistic Fuzzy Assignment Problem under Similarity Measure and Score Function <i>Gaurav Kumar, Rakesh Kumar Bajaj, Rajeev Kaushik, and Jimson Mathew</i>	234
24.	Empirical Model for Green IT Management Using System Dynamics <i>Sparsh Arora</i>	246
25.	VIMCLOUD: A Trust Aware Cloud Computing Framework <i>Prakash Kumar, Krishna Gopal, and Jyoti P. Gupta</i>	253
26.	Location Management for Mobility Pattern Using Evolutionary Algorithm Optimized Neural Network <i>J. Amar Pratap Singh, S. Nirmala, and J. Dheebea</i>	265
27.	Generalized Geometric Weights for Assigning Credits to Multiple Authors: Inputs to Algorithms for Computing Weighted Indices <i>Ash Mohammad Abbas</i>	279
28.	A Mathematical Model for Load Balancing in Cloud Environment <i>Akshay Jain, Anagha Yadav, Lohit Krishnan, and Jibi Abraham</i>	289
29.	Detection of Hidden Meaning of a Sentence Using NGD and PMI <i>Sonal N. Deshmukh, Ratnadeep R. Deshmukh, and Sachin N. Deshmukh</i>	303
30.	Numerical Study on Isotachophoresis of Ions and Its Interaction with the Pressure-Driven Convection <i>Partha P. Gopmandal and Somnath Bhattacharyya</i>	312

31. Classification of Benign and Malignant Tumours Using Back Propagation Neural Network 328
G. Bharatha Sreeja, P. Rathika, and D. Devaraj
32. Mapping the Indian Blogosphere: Topical Trends, Entities and Sentiment of Indian Bloggers in 2012 339
Kriti Kohli and Vivek Kumar Singh
33. A Numerical Simulation in a Suspension of Gyrotactic Viscoelastic Micro-organism
Vibrating Vertically with High Frequency 350
Veena Sharma, Renu Kumari, Radhe Shyam, and Jyoti P. Gupta

Advances in Energy Aware Computing and Communication Systems

This volume includes selected manuscripts from the Second International Conference on Eco-friendly Computing and Communication Systems (ICECCS).

The 2013 Conference has been organized at the Jaypee University of Information Technology (JUIT), Wanknaghat, Himachal Pradesh, India between 17-19 October 2013 in association with Department of Science and Technology (DST), Government of India; Department of Electronics and Information Technology (DeitY), Government of India; Defence Research and Development Organisation (DRDO); and Department of Tourism and Civil Aviation (Himachal Pradesh).

Established in 2002, Jaypee University of Information Technology (JUIT) is a premier professional institution striving for holistic excellence in education to mould young and vibrant engineers.

Organiser

Jaypee University of Information Technology
Wanknaghat, Himachal Pradesh, India



Professional

ISBN-13: 978-9-35-134332-5
ISBN-10: 9-35-134332-4

