

Lecture Notes in Networks and Systems 963

Debasis Giri · Jaideep Vaidya ·
S. Ponnusamy · Zhiqiang Lin ·
Karuna Pande Joshi ·
V. Yegnanarayanan *Editors*

Proceedings of the Tenth International Conference on Mathematics and Computing


ICMC 2024, Volume 2

 Springer

Lecture Notes in Networks and Systems

Volume 963

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, Türkiye

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).

Debasis Giri · Jaideep Vaidya · S. Ponnusamy ·
Zhiqiang Lin · Karuna Pande Joshi ·
V. Yegnanarayanan
Editors

Proceedings of the Tenth International Conference on Mathematics and Computing

ICMC 2024, Volume 2

 Springer

Editors

Debasis Giri
Department of Information Technology
Maulana Abul Kalam Azad University
of Technology
Kolkata, West Bengal, India

S. Ponnusamy
IIT Madras
Chennai, Tamil Nadu, India

Karuna Pande Joshi
The University of Maryland, Baltimore
County (UMBC)
Baltimore, USA

Jaideep Vaidya
Rutgers University
New Jersey, USA

Zhiqiang Lin
The Ohio State University
Columbus, USA

V. Yegnanarayanan
Kalasalingam Academy of Research
and Education
Srivilliputhur, Tamil Nadu, India

ISSN 2367-3370

ISSN 2367-3389 (electronic)

Lecture Notes in Networks and Systems

ISBN 978-981-97-2068-2

ISBN 978-981-97-2069-9 (eBook)

<https://doi.org/10.1007/978-981-97-2069-9>

© The Editor(s) (if applicable) and The Author(s), under exclusive license to Springer Nature Singapore Pte Ltd. 2024

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

If disposing of this product, please recycle the paper.

Committees

Chief Patron

Dr. K. Sridharan, Chancellor, Kalasalingam Academy of Research and Education, Tamil Nadu, India

Patrons

Smt. Dr. S. Arivalagi, Pro-Chancellor, Kalasalingam Academy of Research and Education, Tamil Nadu, India

Dr. S. Shasi Anand, Vice-President, (Academic), Kalasalingam Academy of Research and Education, Tamil Nadu, India

Er. S. Arjun Kalasalingam, Vice-President (Administration), Kalasalingam Academy of Research and Education, Tamil Nadu, India

Co-patrons

S. Narayanan, Vice Chancellor, Kalasalingam Academy of Research and Education, Tamil Nadu, India

V. Vasudevan, Registrar, Kalasalingam Academy of Research and Education, Tamil Nadu, India

General Chairs

P. K. Saxena, Scientific Consultant-Cyber Security, Government of India, Former Director, SAG, DRDO, New Delhi, India

P. D. Srivastava, IIT Bhilai, Raipur, India

Programme Chairs

Jaideep Vaidya, Rutgers University, USA

S. Ponnusamy, IIT Madras, Chennai, India

Zhiqiang Lin, The Ohio State University, USA

Karuna Pandey Joshi, The University of Maryland, Baltimore County (UMBC), USA

Debasis Giri, Maulana Abul Kalam Azad University of Technology, WB, India

Organizing Chair

Yegnanarayanan Venkataraman, Kalasalingam Academy of Research and Education, TN, India

International Advisory Committee

Alfred Menezes, University of Waterloo, Canada

Bhavani Thuraisingham, University of Texas, USA

Bimal Roy, ISI Kolkata, India

Chris Mitchell, Royal Holloway, University of London, UK

Dieter Gollmann, Hamburg University of Technology, Germany

Elisa Bertino, Purdue University, USA

Heinrich Begehr, Freie Universitat Berlin, Germany

Joel J. P. C. Rodrigues, University of Petroleum (East China), China

Kouichi Sakurai, Kyushu University, Japan

Lajos Hanzo, University of Southampton, Southampton, UK

Mahesh Kalyanaraman, Associate Vice-President, HCL, India

Mark Sepnaski, Baylor University, Waco, Texas, USA

Mohan Kankanhalli, National University of Singapore, Singapore

Mohammad S. Obaidat, University of Texas-Permian Basin, USA

Merouane Debbah, University of Texas-Permian Basin, USA

Moti Yung, Columbia University, USA

Oscar Castillo, Tijuana Institute of Technology, Mexico

Rajkumar Buyya, University of Melbourne, Australia
Rakesh M. Verma, University of Houston, USA
Sokratis Katsikas, Norwegian University of Science and Technology-NTNU,
Norway
Valentina E. Balas, Aurel Vlaicu University of Arad, Romania
Veni Madhavan C. E., IISc Bangalore, India
Vishnu S. Pandyala, San Jose State University, USA

Members of the Organizing Committee

P. Deepalakshmi, Dean, SOC, KARE
C. Ramalingan, Dean, SAS, KARE
P. Sarasu, Director—International Relations, KARE
K. Karuppasamy, Professor of Mathematics, KARE
S. Balamurali, Senior Professor of Mathematics, KARE
S. Dhanasekaran, HOD, IT, KARE
K. Kartheeban, Head, CA and CSIT, KARE
M. Kameswari, HOD, Maths, KARE
K. Suthendran, Associate Professor (SG), IT, KARE
M. Jayalakshmi, Associate Professor, CSE, KARE
L. Sreenivasulu Reddy, Associate Professor, Maths, KARE
B. Reddappa, Associate Professor, Maths, KARE
T. Shanmughapriya, Assistant Professor, Maths, KARE
N. Sureshkumar, Professor, CSE, KARE
C. Balasubramanian, Associate Professor, CSE, KARE
N. C. Brintha, Associate Professor, CSE, KARE
AmuthaGuka, Associate Professor, CA, KARE
V. Baby Shalini, Associate Professor, IT, KARE
K. Maharajan, Associate Professor, CSE, KARE
Jane Rubel Angelina, Associate Professor, CSE, KARE
R. Murugeswari, Associate Professor, CSE, KARE
T. Sam PradeepRaj, Associate Professor, CSE, KARE
A. Parivazhagan, Associate Professor, CSE, KARE
V. Anusuya, Associate Professor, CSE, KARE
Abhishek Tripathi, Associate Professor, CSE, KARE

Members of the Design and Web Development

S. Suprakash and Prem Raja, School of Computing and his Team

Members of the Technical Programme Committee

Abhishek Kumar Singh, VIT University Chennai, India
 Achyutha Krishnamoorthy, CMS College Kottayam, Kerala, India
 A. Menaka Pushpa, VIT, Chennai, India
 A. Vanav Kumar, National Institute of Technology, Arunachal Pradesh, India
 Aditi Gangopadhyay, IIT Roorkee, India
 Amit Prakash Singh, Guru Gobind Singh Indraprastha University, New Delhi, India
 Amitabh Gyan Ranjan, MGCUB, Mahatma Gandhi Central University, Bihar, India
 Amrit Pal, VIT, Chennai, India
 Anita Pal, National Institute of Technology Durgapur, India
 Anjana Gosain, Guru Gobind Singh Indraprastha University, Punjab, India
 Anup Kumar Sharma, NIT Raipur, India
 Anurag Goel, Delhi Technological University, New Delhi, India
 Apu Kumar Saha, NIT Agartala, Agartala, Tripura, India
 C. Arun Kumar, Amrita Vishwa Vidyapeetham, Coimbatore, India
 Arvind K. R. Sinha, NIR, Raipur, India
 Arya Kumar Bedabrata Chand, IIT Madras, India
 Ashok Kumar Das, University of Calcutta, West Bengal, India
 R. V. Aswiga, VIT, Chennai, India
 Ajanta Das, Amity University Kolkata, India
 Ali Ebrahimnejad, Qaemshahr Branch, Islamiz Azad University, Qaemshahr, Iran
 Arif Ahmed Sk, University of Tromsø, Norway
 Arvind Kumar Gupta, IIT Ropar, Punjab, India
 Amitabh Gyan Ranjan, MGCUB, Mahatma Gandhi Central University, Bihar, India
 Arshad Khan, Jamia Millia Islamia (A Central University) New Delhi, India
 Abhijit Das, NIT Trichy, Thiruchirapalli, India
 Ankita Vaish, Institute of Science Banaras Hindu University, India
 Arvind Selwal, Central University of Jammu, India
 Aquil Khan, Indian Institute of Technology Indore, India
 A. Swaminathan, IIT Roorkee, India
 Arvind Selwal, Central University of Punjab Bathinda, India
 Atul, NIT, Trichy, India
 Aditi Gangopadhyay, IIT Roorkee, India
 A. K. Bedabrata Chand, IIT Madras, India
 Amandeep Kaur, Central University of Jammu, India
 Anshul Verma, Institute of Science, Banaras Hindu University, Varanasi, India
 Abhijit Datta Banik, IIT Bhubaneswar, India
 Ajit Das, Bodoland University Kokrajhar, Assam, India
 Ajoy Kumar Khan, Mizoram University Aizawl, Mizoram, India
 Aleksandr Poliakov, Sevastopol State University, India
 Amit Banerjee, South Asian University, New Delhi, India
 Amit Maji, IIT Kharagpur, India
 Amiya Nayak, University of Ottawa, Canada

Ankit Rajpal, University of Delhi, Delhi, India
Anuj Jakhar, IIT Madras, India
Anupam Saikia, Indian Institute of Technology Guwahati, India
Arnab Patra, Indian Institute of Technology Kharagpur, India
Arun Kumar, National Institute of Technology, Rourkela, Odisha, India
A. Swaminathan, IIT Roorkee, India
Asish Bera, BITS Pilani, India
Atena Ghasemabadi, Esfarayen University of Technology, India
Ayaz Ahmad, NIT Patna, India
Ashok Kumar Das, International Institute of Information Technology, Hyderabad, India
Anoop Singh, IIT (BHU), Varanasi, India
Atasi Deb Ray, University of Calcutta, India
S. Ananda Kumar, VIT, Chennai, India
Annappa, NIT Karnataka, Surathkal, India
A. Senthil Thilak, NIT Karnataka, Surathkal, India
Alagu Manikandan Esakkimuthu, Cognizant, Hartford, USA
Adhvitha Premanand, NUS-National University of Singapore, Singapore
Anantha Narayanan, Accenture Technology Solutions, Dallas, USA
Arunkumar Pichaimuthu, Verizon, Concord, USA
Andavarayan Muthuraju, Syntel Ltd., Toronto, Canada
Anabayan, Cap Gemini, Atlanta, USA
Arun Kumar, Langara College, Vancouver, BC Richmond, Canada
Anandaraj Selvarangan, Tata Consultancy Services, Minneapolis, USA
Amutha, ABB Ltd., California City, USA
Akhil, Ericsson, San Francisco, USA
J. Abraham Stephen, TCS, Plano, USA
Arthy Paul Brito, Cardiff University, Wales, UK
Amit Kumar Verma, IIT Patna, India
Avijit Duary, Maulana Abul Kalam Azad University of Technology, West Bengal, India
Adriana Mihaela Coroiu, Babes-Bolyai University, Romania
Abd Raouf ChouikhaView Abd, Universite Paris-Sorbonne, Paris Nord, France
Angela Thompson, Governors State University, Greater Chicago, USA
Andrew Pownuk, The University of Texas at El Paso, USA
Abhimanyu Mukerji, Amazon, Bay Area, California, USA
Ashwin Viswanathan Kannan, Amazon Labs CA, USA
Balachander Palanisamy, Computer Sciences Corporation, USA
Balaji Krishnamoorthy, NTT Data UK, Bristol, UK
Bimal Mandal, IIT Jodhpur, India
Bipul Kumar Sarmah, Tezpur University, Napaam, Sonitpur, Assam, India
Bok-Min Goi, Universiti Tunku Abdul Rahman, Malaysia
Baskar Babujee, MIT Campus, Anna University, India
B. Sundaravadivoo, Alagappa University, Karaikudi, India
Bapan Ghosh, Indian Institute of Technology Indore, India

B. Nithya, National Institute of Technology Tiruchirappalli, India
 Balagopal Komarath, IIT Gandhinagar, Gujarat, India
 Balendu Bhooshan Upadhyay, IIT Patna, Bihar, India
 Bankim C. Mandal, IIT Bhubaneswar, India
 Bhabesh Nath, Tezpur University, India
 Bhanuman Barman, National Institute of Technology Patna, Bihar, India
 Bidyut Kr. Patra, National Institute of Technology, India
 Bimal Roy, Indian Statistical Institute, Kolkata, India
 Bipul Sauraph, IIT Gandhinagar, Gujarat, India
 B. R. Shankar, NITK (National Institute of Technology Karnataka), Surathkal, Mangalore, India
 B. Sundaravadivoo, Alagappa University, Karaikudi, India
 Balasubramanian Raman, Indian Institute of Technology Roorkee, India
 Balendu Bhooshan Upadhyay, IIT Patna, Bihar, India
 Bijendra Kumar, Nethaji Subhas University of Technology, New Delhi, India
 C. Mandal, IIT Kharagpur, West Bengal, India
 C. Chandra Sekhar, IIT Madras, India
 J. Cynthia, Kumaraguru College of Technology, Coimbatore, India
 Costin Badica, University of Craiova, Romania
 Ch. Srinivasa Rao, IIT Madras, India
 C. Shoba Bindu, JNTU Anantapur, India
 A. Chandrashekar, Central University of Tamil Nadu, India
 Chayan Halder, West Bengal State University, India
 Chien-Ming Chen, Harbin Institute of Technology Shenzhen Graduate School, China
 Carynthia Kharkongor, Delhi Skill and Entrepreneur University, France
 K. Chandrasekaran, NIT Karnataka, Suratkal, France
 Christina Boura, Université de Versailles Saint-Quentin-en-Yvelines, France
 Chandramohan Lakshman, TriNet, PeopleSoft Technical Professional HCM/CRM, San Francisco, USA
 Chandrashekar Ramamurthi, Verizon Telecom, Dallas, USA
 Canan Bozkaya, Middle East Technical University, Turkey
 Diwas Srivastava, CNRS, Montpellier, France
 Dhamodharan Narayanan, AT&T, Telecommunications, Dallas, USA
 R. Divya Meenakshi, Qode Media Inc., Canada
 Daya Gupta, Delhi Technological University, New Delhi, India
 Digambar Pawar, University of Hyderabad, France
 D. Mishra, NIT Raipur, India
 Dalibor Froncek, University of Minnesota, USA
 Debasis Giri, Maulana Abul Kalam Azad University of Technology, West Bengal, India
 Deepa Kumar, Kalasalingam Academy of Research and Education, Tamil Nadu, India
 Deepjyoti Goswami, Tezpur University, Napaam, Assam, India
 Dieter Gollmann, Hamburg University of Technology, Germany
 Dijana Mosaic, University of Nis, Serbia

Dilip Kumar Maiti, Vidyasagar University, West Bengal, India
 Dilpreet Kaur, Indian Institute of Technology Jodhpur, India
 Djamal Foukrach, Hassiba Benbouali University of Chlef, Algeria
 D. Bhargavi, NIT Warangal, India
 Debashis Dutta, NIT Warangal, India
 Debashis Nandi, National Institute of Technology, India
 Debraj Giri, IIT, India
 Deepak Ranjan Nayak, Malaviya National Institute of Technology Jaipur, Rajasthan, India
 P. Deepalakshmi, Kalasalingam Academy of Research and Education, India
 Devanayagam Palaniappan, Texas A&M University Corpus—Christi, USA
 Dhananjoy Dey, Indian Institute of Information Technology Lucknow, India
 Dinabandhu Pradhan, IIT (ISM) Dhanbad, India
 Dipanwita Roy Chowdhury, IIT Kharagpur, India
 Durga Charan Dalal, Indian Institute of Technology Guwahati, India
 Debasish Bera, Indian Institute for Information Technology, Kalyani, India
 Debasisha Mishra, NIT Raipur, India
 Deepti Jain, Sri Venkateswara College, University of Delhi, India
 C. Devadas Nayak, M.I.T., Manipal, India
 Dhananjay Gopal, Guru Ghasidas Vishwavidyalaya (A Central University), Bilaspur (C.G.), India
 Dharmendra Tripathi, National Institute of Technology, Uttarakhand, India
 Edythe E. Weeks, Esq, Washington University, St. Louis, MO, USA
 Floyd B. Hanson, University of Illinois, USA
 Fateme Shahsavand, Malayer University, Malaysia
 Fabienne Chaplais, Mathedu SAS, Paris, France
 Fagen Li, University of Electronic Science and Technology of China, China
 Fu-Hsing Wang, Chinese Culture University, China
 Falguni Roy, NIT, Karnataka, Suratkal, India
 A. Firos, Rajiv Gandhi University, Arunachal Pradesh, India
 Gaurav Bhatnagar, Indian Institute of Technology Jodhpur, China
 K. A. Germina, Central University of Kerala, Kerala, India
 Gopal Chandra Shit, Jadavpur University, Kolkata, India
 Gautham Singh, NIT, Trichy, India
 Gururaj Mukarambi, Central University of Karnataka, India
 Guru Prem Prasad, IIT Guwahati, India
 G. S. Mahapatra, NIT, Puducherry, India
 G. Malathi, VIT Chennai, India
 Geetanjali Chattopadhyay, Malaviya National Institute of Technology Jaipur, India
 T. Gireesh Kumar, Amrita Vishwa Vidyapeetham, Coimbatore, India
 Gitanjali Chandwani, IIT Kharagpur, India
 Gopal Chandra Shit, Jadavpur University, Kolkata, India
 S. Gowrisankar, NIT, Patna, India
 H. J. Gowtham, Manipal Academy of Higher Education, Manipal, India
 Ganapathy Shanmugam Paramasivan, Medical University of Graz, Graz, Austria

Gaurav Kumar Singh, BE.services GmbH, Munich, Germany
 Govindh Sankaran, Wolters Kluwer, Boston, USA
 Ganesh Kumar, Judge Software, Charlotte, USA
 Gerard Weiss, University of Maastricht, Germany
 Halina Kwasnicka, Wroclaw University of Technology, USA
 Hisao Ishibuchi, Osaka Prefecture University, Japan
 H. Ramesh, Indian Institute of Technology Guwahati, Guwahati, India
 Hari Vansh Rai Mittal, Indian Institute of Technology Palakkad, Kerala, India
 H. Ramesh, Indian Institute of Technology Guwahati, Guwahati, India
 Haowen Tan, Kyushu University, Japan
 Hari Vansh RaiMittal, Indian Institute of Technology Palakkad, Kerala, India
 Harshdeep Singh, DRDO, New Delhi, India
 Heinrich Begehr, Free University Berlin, Germany, Germany
 Hiranmoy Mondal, MAKAUT, India
 Indranath Sengupta, IIT Gandhinagar, India
 Ishapathik Das, IIT Tirupati, AP, India
 Indivar Gupta, SAG, DRDO, India
 Irani Hazarika, Gauhati University, Guwahati, India
 Idrees Qasim, NIT, Srinagar, India
 Ibrahim Venkat, Universiti Teknologi Brunei, Malaysia
 Ingo Schiermeyer, TU Bergakademie Freiberg, Germany
 Jos. M. Koomen, Memes Ltd., Utrecht, The Netherlands
 Ji Wang, Ningbo University, China
 Jay Veerasamy, The University of Texas at Dallas, USA
 Joshva Rajkumar, Ministry for Primary Industries (MPI), Wellington, New Zealand
 Joshua Gnanaruban, NCS Pte Ltd. (Singapore), Singapore
 Jadav Das, MAKAUT, West Bengal, India
 Jamuna Kanta Sing, Jadavpur University, West Bengal, India
 Jaspal Singh Aujla, National Institute of Technology, Jalandhar, Punjab, India
 JervinZen Lobo, St. Xavier's College Mapusa—Goa, India
 Jothi Ramalingam MACS, NIT, Karnataka, Suratkal, India
 Jyotsna Yadav, Guru Gobind Singh Indraprastha University, Punjab, India
 Jagdish Prasad Maurya, Rajiv Gandhi University (A Central University), Arunachal Pradesh, India
 Janakiraman, NIT, Trichy, India
 Jaroslaw Adam Miszczak, Institute of Theoretical and Applied Informatics, Polish Academy of Sciences, Poland
 Jaydeb Bhaumik, Jadavpur University, Kolkata, India
 Jianting Ning, Singapore Management University, Singapore
 Jugal K. Verma, IIT Bombay, India
 J. Pavan Kumar, National Institute of Technology Tiruchirappalli, India
 Jagdish Prakash, University of Johannesburg, South Africa
 Jaideep Vaidya, Rutgers University, USA
 Jayanta, Tezpur University, Assam, India
 Jayanta Mukhopadhyay, Indian Institute of Technology Kharagpur, India

Jothi Ramalingam, MACS, NIT, Karnataka, Suratkal, India
 Jugal Prajapat, Central University of Rajasthan, India
 Jana Dittmann, Uni Magdeburg, India
 Jyotismita Talukdar, Tezpur University, India
 J. Christy Roja, St. Joseph's College, Trichy, India
 K. Muthukumaran, VIT, Chennai, India
 K. Somasundaram, Amrita Vishwa Vidyapeetham, Coimbatore, Tamil Nadu, India
 Kartick Chandra Mondal, Jadavpur University, Kolkata, West Bengal, India
 Karuna P. Joshi, University of Maryland, Baltimore County, USA
 Kaushik Mondal, IIT, Ropar, Punjab, India
 Kaushik Roy, West Bengal State University, Barasat, India
 Kirankumar R. Hiremath, Indian Institute of Technology Jodhpur, India
 Kunwer Singh Mathur, Dr. Hari Singh Gaur Viswavidyalaya Sagar, Central University of MP, India
 Khurram Mustafa, JMI, New Delhi, India
 K. Saraswathi, UCEK, JNTUK, India
 Kadambari Raghuram, University College of Engineering Kakinada (Autonomous), Jawaharlal Nehru Technological University Kakinada, India
 Kalpesh Kapoor, Indian Institute of Technology Guwahati, India
 Kalyanbrat Medhi, Gauhati University, Assam, India
 Khaleel Ahmed, Maulana Azad National Urdu University, Telangana, India
 Khalid Mahmood, COMSATS University Islamabad, Sahiwal Campus, India
 Kotaiah Bonthu, Central Tribal University of Andhra Pradesh, India
 Kunwer Singh Mathur, Dr. Hari Singh Gaur Viswavidyalaya Sagar, Central University of MP, India
 K. Palpandi, Malaviya National Institute of Technology (MNIT), Jaipur, Rajasthan, India
 K. Saraswathi, UCEK, JNTUK, India
 Kadambari Raghuram, University College of Engineering Kakinada (Autonomous), Jawaharlal Nehru Technological University Kakinada, India
 Kamalika Bhattacharjee, NIT Trichy, India
 Khalid Raza, Jamia Millia Islamia (Central University), New Delhi, India
 Kolin Paul, IIT Delhi, India
 Kushal Sharma, MNIT Jaipur, India
 Kusum Sharma, National Institute of Technology, Uttarakhand, India
 Karthikeyan Shenbagam, Link Systems, Houston, USA
 Kamesh, Infosys, United States
 Karthi Vicky, Hinduja Global Solutions, UK
 Kouichi Sakurai, Kyushu University, Japan
 Kumari Priyanka, University of Hohenheim, Germany
 Kavitha Haldorai, Florida State University, USA
 K. Somasundaram, Amrita Vishwa Vidyapeetham, Tamil Nadu, India
 Longxiu Huang, Michigan State University, India
 Lok Pati Tripathi, Indian Institute of Technology Goa Farmagudi, Ponda 403401, Goa, India

Lavanya Selvaganesh, Indian Institute of Technology (BHU), Varanasi, India
Lev Kazakovtsev, Siberian State Aerospace University, Russia
Maharage Nisansala Sevewandi Perera, ATR, Japan
Malay Banerjee, IIT Kanpur, India
Manikandan Rangaswamy, Central University of Kerala, Kerala, India
Manish Kumar Gupta, Guru Ghasidas Vishwavidyalaya, Bilaspur, India
Mario Larangeira, Tokyo Institute of Technology/IOHK, Japan
Md. Abu Talhamainuddin Ansary, IIT-Jodhpur, India
Meenakshi Thakur, Central University of Himachal Pradesh, India
Mohua Banerjee, IIT, Kanpur, India
Moumita Mandal, Indian Institute of Technology Jodhpur, Rajasthan, India
Mriganka Mandal, Indian Institute of Technology (IIT) Jodhpur, India
Muslim Malik, Indian Institute of Technology Mandi, India
Manoj Kumar Singh, Institute of Science, Banaras Hindu University Varanasi, India
Mritunjay Kumar Singh, IIT (ISM) Dhanbad, Dhanbad-826004, Jharkhand, India
Mohd. Arshad, Indian Institute of Technology Indore, Khandwa Road, Simrol, Indore, India
M. P. Pradhan, Sikkim University, Sikkim, India
M. Tiken Singh, Dibrugarh University Institute of Engineering and Technology, India
Madhumangal Pal, Vidyasagar University, India
Mahendra Kumar Gupta, IIT Bhubaneswar, India
Mahipal Jadeja, Malaviya National Institute of Technology, Jaipur, India
Manideepa Saha, NIT Meghalaya, India
Manmohan Vashisth, Indian Institute of Technology (IIT-JMU) Jammu, India
V. Mary Anita Rajam, Anna University, Chennai, India
Md. Obaidullah Sk, Aliah University, India
Megha Khandelwal, Central University of Karnataka, India
Muhammad Abulaish, South Asian University, New Delhi, India
T. Muthukumar, Indian Institute of Technology-Kanpur, India
M. Sethumadhavan, Amrita Vishwa Vidyapeetham, Coimbatore, India
Madhusudana Rao Nalluri, Amrita Vishwa Vidyapeetham, Coimbatore, India
Mahendra Kumar Gupta, IIT Bhubaneswar, India
Mahesh Shirole, VJTI-Mumbai, India
Malay Kule, IEST, Shibpur, India
Manju Khari, Jawaharlal Nehru University, New Delhi, India
Md. Maqbul, National Institute of Technology Silchar, Assam, India
Mohammad Aslam Siddeeqe, AMU, Aligarh, India
Mohammad Mueenul Hasnain, Kamala Nehru College University of Delhi, India
Munesh Meena, DSEU, New Delhi, India
M. Devakar, Visvesvaraya National Institute of Technology (VNIT) Nagpur, India
K. Manikandan, VIT, Vellore, India
Mahendra Pratap Singh, NIT Karnataka, Suratkal, India
Mohammed Hakim Jaffer Ali, SciLifeLab (Science for Life Laboratory), Stockholm, Sweden
Muthukrihnan Govindaraj, eGrove Systems, Sayreville, USA

Manivannan Karunanithi, Endera Systems LLC, McLean, USA
Mariappan Madasamy, HM Revenue and Customs, London, UK
Muthusamy Subash Rajasekaran, Tata Consultancy Services, Bloomington, USA
Mayan Sinha, Salesforce.com, USA
Muthu Rajathi, Tata Consultancy Services Ltd., Manchester, USA
Mohandoss Karuppiiah, Cognizant Technology Solutions Pvt. Ltd., Virginia Beach, USA
Mihai Caragiu, Ohio Northern University, USA
Manimuthu Arunmozhi, Aston University, Birmingham, UK
Marcin Paprzycki, Systems Research Institute Polish Academy of Sciences, Warsaw, Poland
Nicholas Caporusso, Northern Kentucky University, USA
Navanietha Rathinam, American Society for Microbiology, Rapid City, USA
Nobin Saha, University of Bedfordshire, UK
Nazia Parveen, Aligarh Muslim University, Aligarh, India
V. Neelanarayanan, VIT, Chennai, India
Neha Kaushik, DSEU, New Delhi, India
Nemi Chandra Rathore, Central University of South Bihar, Gaya, India
Nirmal Kaur, Panjab University, Chandigarh, India
N. Balasubramani, NIT, Trichy, India
Neeraj Rathore, Indira Gandhi National Tribal University (IGNTU—A Central University), Amarkantak (M.P.), India
Neelesh S. Upadhye, IIT Madras, India
Neeraj Misra, Indian Institute of Technology, Kanpur, India
Niraj Khare, Carnegie Mellon University, USA
Nitu Kumari, IIT Mandi, India
N. R. Vemuri, University of Hyderabad, Hyderabad, India
N. Anbazhagan, Alagappa University, Karaikudi, India
Neetesh Saxena, Cardiff University, UK
Nemi Chandra Rathore, Central University of South Bihar, Gaya, India
Nesibe Yalçın, Erciyes University, elikgazi/Kayseri, Turkey
Om Prakash, IIT Patna, Bihar, India
C. Oswald, National Institute of Technology Tiruchirappalli, India
Om P. Suthar, Malaviya National Institute of Technology Jaipur, Rajasthan, India
Om Prakash Yadav, NIT, Hamirpur, India
Prakash Chelladurai, Max Planck Institute, Frankfurtam, Germany
Pruthvi Balachandra Kalyandurg, Swedish University of Agricultural Sciences, Uppsala, Sweden
Pon Janani Sugumaran, NUS-National University of Singapore, Singapore
Pratheep Kumar Reddy Yaddala, Target Corporation, Minneapolis, USA
Prakash Ramalingam, Civica, Singapore, Singapore
Pushpalatha Sekar, Cognizant Technology Solutions, San Jose, USA
S. Priya Dharshini, Syntel International Pvt. Ltd., United States
P. Muthu, NIT Warangal, India
Paras Ram, NIT, Kurukshetra, Haryana, India

Patil Shrishailappa Tatyasaheb, Vishwakarma Institute of Technology, Pune, India
V. Pattabiraman, VIT, Chennai, India
Piyali Debnath, NIT Agartala, Agartala, Tripura, India
Pradip Roul, VNIT, Nagpur, India
Pramod Kumar Goyal, Bhai Parmanand DSEU Shakarpur Campus-II, Delhi, India
Prashant Giridhar Shambharkar, Delhi Technological University, New Delhi, India
Prashant Kumar Srivastava, IIT Patna, Bihar, India
Prashant R. Nair, Amrita Vishwa Vidyapeetham, Coimbatore, India
Prem Prakash Mishra, NIT, Nagaland, India
Priti Kumar Roy, Jadavpur University, Kolkata, India
Priyanka Harjule, Malaviya National Institute of Technology (MNIT), Jaipur, Rajasthan, India
Projesh Nath Choudhury, IIT Gandhinagar, Gujarat, India
Purushottam Kar, IIT Kanpur, India
Pabitra Pal, Vidyasagar University, India
Prabhat Ranjan, Central University of South Bihar, Gaya, India
Prashant Kumar Srivastava, IIT Patna, Bihar, India
Pratibhamoy Das, IIT Patna, Bihar, India
Prodipto Das, Assam University (A Central University), Silchar, India
Prof. Dr. Jana Dittmann, University of Magdeburg, Germany
Projesh Nath Choudhury, IIT Gandhinagar, Gujarat, India
P. K. Parida, Central University of Jharkhand, Ranchi, India
P. Muthukumar, IIT Kanpur, India
P. P. Murthy, Guru Ghasidas Vishwavidyalaya (A Central University), Bilaspur (Chhattisgarh), India
Pablo Berna, CUNEF Universidad, Spain
Panchatcharam Mariappan, IIT Tirupati, India
Pankaj K. Das, Tezpur University, Sonitpur, Assam, India
Pawan Kumar, Indira Gandhi National Open University Maidan Garhi, New Delhi, India
Pradip Sasmal, IIT Jodhpur, India
Prasun Ghosal, Indian Institute of Engineering Science and Technology, Shibpur, India
Praveen Kumar Gupta, National Institute of Technology Silchar, India
Predrag Stanimirovic, University of Nis, Serbia
Punam Gupta, Dr. Hari Singh Gaur Viswavidyalaya Sagar, Central University of MP, India
Puneet Sharma, IIT Jodhpur, Rajasthan, India
Patitapaban Rath, Kalinga Institute of Industrial Technology (KIIT) Deemed to be University, Odisha, Bhubaneswar, India
Pramod Kewat, IIT, Dhanbad, India
P. K. Sahoo, Birla Institute of Technology and Science, Pilani Hyderabad Campus, India
P. Venkata Suresh, Indira Gandhi National Open University, New Delhi, India
Pushkar S. Joglekar, Vishwakarma Institute of Technology, Pune, India

Promila Kumar, Gargi College (University of Delhi), India
Pedro Caceres, Fort Worth Metroplex, Dallas, USA
Radhakrishna Bhat, Manipal Institute of Technology, Manipal Academy of Higher Education, Manipal, Karnataka, India
S. Rajkumar, VIT, Chennai, India
Robert Richardson, Ravensbourne University London, UK
B. R. Rakshith, MIT, Manipal, India
Rajat Kumar Pal, University of Calcutta, India
G. Rajeshkumar, Bannari Amman Institute of Technology, TN, India
Raj Nandkeolyar, NIT, Jamshedpur, India
Romi Banerjee, IIT Jodhpur, India
Ranjit Kumar Upadhyay, Indian Institute of Technology (Indian School of Mines), Dhanbad, Jharkhand, India
R. Kalyanaraman, Annamalai University, Tamil Nadu, India
Rajat Kanti Nath, Tezpur University, Assam, India
Rajendra K. Ray, Indian Institute of Technology Mandi, India
D. Ranganatha, Central University of Karnataka, India
B. V. Rathish Kumar, IIT Kanpur, India
Rabinder Kumar Prasad, D.U.I.E.T. Dibrugarh University, Assam, India
Rafikul Alam, IIT Guwahati, Guwahati, India
Rahul Kumar Chawda, Assam University, Silchar, India
Rajendra Kumar Roul, Thapar Institute of Engineering and Technology, India
Rakesh Arora, IIT (BHU), Varanasi, India
Ranbir Sanasam, Indian Institute of Technology Guwahati, India
Ratikanta Behera, IISc Bangalore, India
Rohit Kumar Mishra, IIT Gandhinagar, Gujarat, India
Rupam Barman, Indian Institute of Technology Guwahati, Assam, India
Rifat Colak, Firat University, Türkiye
Reshma Rastogi, South Asian University, New Delhi, India
Ravi Subban, Pondicherry University, Puducherry, India
Ravi Kanth Asv, National Institute of Technology Kurukshetra, India
R. Eswari, NIT Trichy, India
R. Radha, University of Hyderabad, Hyderabad, India
R. Jagadeesh Kannan, Vellore Institute of Technology | Chennai Campus, Chennai, India
R. Kalyanaraman, Annamalai University, Tamil Nadu, India
R. Meher, S. V. National Institute of Technology, Surat, Gujarat, India
R. Suganya, VIT Chennai, India
Rabinder Kumar Prasad, D.U.I.E.T. Dibrugarh University, Assam, India
Rahul Kumar Chawda, Assam University, Silchar, India
Raj Kamal Maurya, SVNIT, Surat, Gujarat, India
Rajat Kanti Nath, Tezpur University, Assam, India
Rajat Tripathi, NIT, Jamshedpur, Jharkhand, India
Rajendra Kumar Roul, Thapar Institute of Engineering and Technology, India

Rajesh Ingle, International Institute of Information Technology, Naya Raipur, (IIIT NR), Chhattisgarh, India
Raksha Pandey, Guru Ghasidas Vishwavidyalaya, Bilaspur, India
Ramesh Kumar Vats, NIT Hamirpur, India
Ramesh Ragala, VIT Chennai, India
Ranjan Kumar Jana, Sardar Vallabhbhai National Institute of Technology (SVNIT) Surat, Gujarat, India
Ranjit Kumar Upadhyay, Indian Institute of Technology (Indian School of Mines), Dhanbad, Jharkhand, India
B. V. Rathish Kumar, IIT Kanpur, India
Reshma Rastogi (nee Khemchandani), South Asian University, New Delhi, India
Rifaqat Ali, NIT, Hamirpur, India
Ritu Agarwal, Malaviya National Institute of Technology Jaipur, Rajasthan, India
Rathina Kumar, University of Virginia, Charlottesville, USA
Raghunath Vel, University of Wolverhampton, UK
Rajaguru Paramasamy, H-E-B, Sr. PeopleSoft, San Antonio, USA
Ramprasad Renganathan, Omnitracs, North Atlanta, USA
Radhakrishnan Seenivasan, NTT DATA Americas, Pittsburgh, USA
Rajkumar Kathiresan, Cognizant Technology, Bentonville, USA
Revathi Balasubramanian, DFKI, Kaiserslautern, Germany
Raja Sekar, Cognizant Technology Solution, Toronto, Canada
Ram Bharadwaj, HCL Technologies, Ottawa, Canada
Rakesh Prabhakar, Cognizant, Winnipeg, Canada
Raja Saravanesh, Cognizant, Owings Mills, USA
Rajesh Kannan Karuppiah, Tata Consultancy Services, Jesus Martin, Mexico
Raja Lingam, Budapest University of Technology and Economics, Hungary
K. R. Renjith, Servian, Sydney, Australia
Ramsundar Kandasamy, Ericsson R&D, Germany
Raja Prabhu, Anya Consultancy Services, UK
B. Rushi Kumar, VIT Vellore, Tamil Nadu, India
Sri Padmavati. B, University of Hyderabad, Telangana, India
Sri Balaji Ponraj, The University of Sydney, Australia
Subathra Kannan, Biocon, Trichy, France
Swati Sharma, North Dakota State University, Fargo, USA
Satheesh Kumar, Nordic BioAnalysis AB, Stockholm, Sweden
Sannasi Nehru, Deloitte Consulting, Washington, USA
Sukumar Subburayan, CISCO, USA
Smitha Samuel, Sabre Inc. Irving, USA
Sangram Ray, National Institute of Technology Sikkim, India
Selvam Adaikkappan, Vistex, Chicago, USA
Saravanakumar Jagadeesan, Deloitte Consulting US, Austin, USA
Sujith Vijayakumar, Infosys Technologies Ltd., Dallas, USA
Sunil Ramkumar, Tata Consultancy Services, London, UK
Sadheesh Radhakrishnan, S-Cube Solutions Ltd. Location: London, UK
N. Shyam Sundar, Motorola Solutions, Plantation, USA

Siddharth Gopinath, Gainwell Technologies, Columbus, USA
Saravanan Sukumar, Cognizant Technology Solutions, Charlotte, USA
Saranya Kamarajan, TCS, USA
Sundar Ramanan, eHarmony, United States
Sowbhagya Lakshminarayanan, Greatness Packagers, Canada
Shanmuganathan, Tata Consultancy Services, United States
Suresh Raja, Tata Consultancy Services, United States
S. A. M. Rizvi, Jamia Millia Islamia, New Delhi, India
S. Amutha, Alagappa University, Karaikudi, India
S. Nithya Roopa, KIT, Coimbatore, India
S. R. Balasundaram, NIT, Trichy, India
Sakthi Prasad, National Institute of Technology, Arunachal Pradesh, India
Sam Johnson, NIT Karnataka, Suratkal, India
Sandeep Shinde, Vishwakarma Institute of Technology, Pune, India
Sanjeev Kumar, NSUT West Campus Jaffarpur Delhi, India
Saurabh Kumar Katiyar, NIT, Jalandar, Punjab, India
Shachi Sharma, South Asian University, New Delhi, India
Shafiqul Abidin, Aligarh Muslim University Aligarh, India
Shakir Ali, Aligarh Muslim University, Aligarh, India
Shanmugam Dhinakaran, Indian Institute of Technology Indore, India
Shraddha S. Suratkar, VJTI-Mumbai, India
Siddhartha Pratim Chakrabarty, Indian Institute of Technology Guwahati, Assam, India
Subrata Bera, National Institute of Technology Silchar, Assam, India
Subuhi Khan, Aligarh Muslim University, India
Sujoy Bhore, IIT Bombay, Mumbai, India
Sumit Kumar Debnath, NIT, Jamshedpur, Jharkhand, India
Sumit Nagpal, University of Delhi, India
Suraiya Jabin, Jamia Millia Islamia (Central University), New Delhi, India
Surendar Ontela, NIT, Mizoram, India
Susantha Maity, National Institute of Technology, Arunachal Pradesh, India
Sushil Kumar, S. V. National Institute of Technology Surat, Gujarat, India
T. R. Swapna, Amrita Vishwa Vidyapeetham, Coimbatore, India
S. Ponnusamy, IIT Madras, India
Saibal Pal, DRDO, New Delhi, India
Sangram Ray, National Institute of Technology Sikkim, India
Sanjay Mohanty, VIT Vellore, India
Santanu Sarkar, IIT Madras, India
Sarita Ojha, Indian Institute of Engineering Science and Technology Shibpur, West Bengal, India
Satrajit Ghosh, Aarhus University, Denmark
Sedat Akleylek, Ondokuz Mayıs University, Turkey
P. Shaini, Central University of Kerala, Kerala, India
Sharanjeet Dhawan, NIIT University, Rajasthan, India
Sharmistha Adhikari, NIT Sikkim, India

Sk Hafizul Islam, IIT Kalyani, India
Sokratis Katsikas, Norwegian University of Science and Technology, Norway
Sourav Mandal, XIM University Bhubaneswar, Odisha, India
Subhas Barman, Jalpaiguri Government Engineering College, West Bengal, India
Subhasis Dasgupta, University of California, San Diego, USA
Suprio Bhar, IIT Kanpur, India
Syed Abbas, IIT Mandi, India
Sandeep Singh Rawat, IGNOU, New Delhi, India
A. Sathishkumar, IIT Madras, India
Sanyasiraju, IIT Madras, India
S. P. Tiwari, Indian Institute of Technology (Indian School of Mines), Dhanbad, Jharkhand, India
Srinivas Kumar Vasana, Indian Institute of Technology Delhi, India
Srinivasa Rao Pentylala, Indian Institute of Technology (ISM) Dhanbad, India
Suchandan Kayal, National Institute of Technology Rourkela, Odisha, India
Sanjeev Singh, Indian Institute of Technology, Indore, MP, India
K. C. Srikantaiah, SJB Institute of Technology, Bengaluru, Karnataka, India
Sangita Jha, NIT Rourkela, India
Sairam Kaliraj, IIT Ropar, Punjab, India
Sreenivasulu Ballem, Central University of Karnataka Kalaburagi, India
Sanjay Kumar, Central University of Jammu, India
S. K. Pandey, IIT (BHU, Varanasi), India
S. P. Tiwari, Indian Institute of Technology (Indian School of Mines), Dhanbad, Jharkhand, India
S. K. V. Jayakumar, Pondicherry University, Pudhucherry, India
Sabyasachi Dutta, University of Calgary, Canada
Sabyasachi Pani, IIT Bhubaneswar, India
Sahana Prasad, BITS Pilani, Rajasthan, India
Saifur Rahman, Rajiv Gandhi University Doimukh, India
Saiyed Umer, ISI Kolkata, India
Saminathan Ponnusamy, IIT Madras, India
Santanu Saha Ray, National Institute of Technology Rourkela, Odisha, India
Sartaj Ul Hasan, Indian Institute of Technology Jammu, India
Sasmita Barik, IIT Bhubaneswar, India
Sujit Das, NIT Warangal, India
A. Sathish Kumar, IIT Madras, India
Satyanarayana Engu, NIT, Warangal, Andhra Pradesh, India
Sedat Akleylek, Ondokuz Mayıs University, Turkey
Shailesh Kumar Tiwari, Indian Institute of Technology Patna, Bihar, India
Shibesh Kumar Jas Pacif, VIT, Vellore, India
Shripad M. Garge, Indian Institute of Technology, Mumbai, India
Shyamalendu Kandar, Indian Institute of Engineering Science and Technology, Shibpur, India
Siddhartha Pratim Chakrabarty, Indian Institute of Technology Guwahati, Assam, India

Siuli Mukhopadhyay, Indian Institute of Technology Bombay, Mumbai, India
 Sivaram Ambikasaran, IIT Madras, India
 Somesh Kumar, Indian Institute of Technology Kharagpur, India
 Somnath Dey, Indian Institute of Technology Indore, India
 Subinoy Chakraborty, Jadavpur University, Kolkata, West Bengal, India
 Srinivasa Rao Kola, NIT, Karnataka, Suratkal, India
 Subit Kumar Jain, NIT, Hamirpur, India
 Srinivasu Bodapati, IIT Mandi, India
 Subir Das, Indian Institute of Technology (BHU), Varanasi, India
 Sudesh Rani, Punjab Engineering College, Deemed to be University, Chandigarh, India
 Sudipta Majumder, Dibrugarh University Institute of Engineering and Technology (DUIET), Assam, India
 Sujata Pal, IIT Ropar, India
 K. Sumesh, IIT Madras, Chennai, India
 S. Bose, College of Engineering, Anna University, India
 Sujoy Bhore, IIT Bombay, India
 Satya Bagchi, NIT Durgapur, India
 Swaleha Zubair, Aligarh Muslim University, India
 S. Gandhiya Vendhan, Bharathiar University, Coimbatore, India
 Sujit Das, NIT, Warangal, India
 Shafik, Nanjing University of Information Science and Technology, China
 Scott Baldrige, Baton Rouge, LA, USA
 Tarak Gaber, The University of Salford, UK
 Terry Kaufman, Institute for Mathematics and Computer Science, Fort Lauderdale, FL, USA
 Triloki Nath, Dr. Hari Singh Gour Vishwavidyalaya, Sagar, MP, India
 Taqseer Khan, Jamia Millia Islamia, Jamia Nagar, New Delhi, India
 Tanmoy Maitra, KIIT University, Bhubaneswar, India
 Tapas Chatterjee, IIT Ropar, Punjab, India
 Tarun Yadav, Defence Research and Development Organisation, New Delhi, India
 Tingwen Huang, Texas A&M University, USA
 Tuhina Mukherjee, Indian Institute of Technology Jodhpur, India
 T. Subbulakshmi, VIT, Chennai, India
 Tamal Pramanick, NIT Calicut, Kozhikode, Kerala, India
 Tanweer Jalal, NIT, Srinagar, India
 Tarni Mnadal, NIT, Jamsheedpur, Jharkhand, India
 Thomas George, Missing Link Technologies Ltd., Moncton, Canada
 Thirumaran Pathakkam Mannai, Elavon, Inc. Knoxville, USA
 Ujwal Warbhe, NIT, Srinagar, India
 Usha Rani, Sri Venkateswara University, Tirupati, Andhra Pradesh, India
 Uaday Singh, Indian Institute of Technology Roorkee, Roorkee-247667 (Uttarakhand), India
 Ushnish Sarkar, Netaji Subhas Open University, India
 Utpal Roy, Siksha-Bhavana Visva-Bharati Santiniketan, Birbhum, WB, India

Udayan Prajapati, St. Xavier's College, Navrangpura, Ahmedabad, India
Vilem Novak, University of Ostrava, Czech Republic
Vinod Kumar, PGDAV College, University of Delhi, Nehru Nagar, New Delhi, India
V. Balakumar, National Institute of Technology Puducherry, Karaikal, India
Vishnu Narayan Mishra, Indira Gandhi National Tribal University, Madhya Pradesh, India
V. V. Subrahmanyam, IGNOU, New Delhi, India
V. Shanthi, NIT Trichy, Tamil Nadu, India
V. D. Ambeth Kumar, Mizoram University, Mizoram, India
Vipindev Adat Vasudevan, Massachusetts Institute of Technology, Cambridge, USA
V. Shanthi, NIT Trichy, Tamil Nadu, India
Vaibhav Dhore, VJTI-Mumbai, India
R. Vedhapriyavadhana, VIT, Chennai, India
Vijayakumar Ramakrishnan, NIT, Calicut, Kerala, India
K. V. Vijayashree, Anna University, Chennai, India
Vinay Singh, NIT Mizoram, India
Vipindev Adat Vasudevan, Massachusetts Institute of Technology, Cambridge, India
Venkatesh Babu Nattamai Balakrishnan, Diconium Digital Solutions, Berlin, Germany
Venguideshe (Venkat) Lakshminarayanan, ServiceNow, Santa Clara, USA
Valli Elangovan, Tata Consultancy Services, Edinburgh, UK
Vijay Shankar, Cognizant, New York, USA
Venkat Sundaram, e-Business International, United States
P. L. Valliappan, ADP Technologies, United States
Venkatesh Srinivason, Tata Consultancy Services Limited, United States
Vasos Pavlika, University College London, UK
Yuvaraj Nagarajan, VIT Infotech, San Ramon, USA
Yamuna Venkates, IStream Jobs, France
Y. D. Sharma, NIT Hamirpur, India
Yegnanarayanan Venkataraman, Kalasalingam Academy of Research and Education, Tamil Nadu, India
Zhiqiang Lin, The Ohio State University, USA

Message from General Chairs

It is really a happy moment for all of us to greet you all at the ICMC 2024, the 10th edition of the highly reputed annual International Conference on Mathematics and Computing. This year, ICMC was organised at the main campus of KALASALINGAM ACADEMY OF RESEARCH AND EDUCATION-KARE located at a small village in the interior of South Tamil Nadu, Krishnankoil-626126, Tamil Nadu, India. The event was held during January 04–07, 2024 followed by a Pre-Conference Symposium on Advanced Mathematical Methods during 02–03, January 2024. It was organised by the Department of Mathematics of School of Advanced Sciences jointly with the School of Computing. We are happy to record the fact that the Ramanujan Mathematical Society (RMS), Cryptology Research Society India (CRSI) and Society for Electronics Transactions and Security (SETS) have participated as joint organisers with KARE. Due to the collective effort of the organisers, we have successfully brought on board 610 eminent personalities as Technical Programme Committee members from all over the world and eighteen eminent speakers from across the globe. It really paved the way for high-quality academic and technical exchange of thought processes between likeminded delegates. As usual, this time also ICMC has created a great impact amongst the participating countries, and everyone have thoroughly enjoyed the academic ambience and the location with the scenic beauty of the southern parts of the Western Ghats of Tamil Nadu. The central theme and topics on mixed areas of Mathematics and Computing created a strong impact. Original research articles published from this 10th edition of ICMC stand as a testimony for the hard work of researchers. We are delighted to record a wonderful fact that a total of 40 papers have been considered for publication in the conference proceeding out of 282 submitted papers through the hard peer-review process by the TPC members. We are much grateful to the following invited speakers for their graceful acceptance and also for having delivered their best of the best speech at the conference. The honourable speakers are Elisa Bertino (Purdue University, USA), Bavani Thuraisingham (University of Texas, USA), Muriel Medard (MIT, USA), Ramamohanarao Kottagiri (University of Melbourne, Australia), Mohammad S. Obaidat (University of Texas-Permian Basin, USA), Sedat Akleylek (Ondokuz Mayis University, Samsun, Turkey), Ekrem Savas (Usak University, Turkey), Bryan

Freyberg (University of Minnesota, USA), Mark Sepanski (Baylor University, Waco Texas, USA), Clare D. Cruz (Chennai Mathematical Institute, India), Jaya Iyer (The Institute of Mathematical Sciences, India), Arvind Ayyar (Indian Institute of Science, India), R. K. Sharma (IIT Delhi, India), Tanmoy Som (IIT (BHU) Varanasi India), Tanmay Basak (IIT Madras, India), Madhumangal Pal (Vidyasagar University, India), A. K. B. Chand (IIT Madras, India) and Vishnu Pendyala (San Jose State University, USA).

We express our sincere gratitude to all the programme and organising committee members for their fantastic review process and other works. We would also like to thank “Illaya Vallal” Dr. Sridharan, Chancellor, and his team at Kalasalingam Academy of Research and Education for their support and excellent infrastructure. **We also thank the sponsors, The Defence Research and Development Organisation (DRDO) and The National Board for Higher Mathematics (NBHM), Government of India, for financial support.** We also appreciate all conference participants for making ICMC a memorable one.

General Chairs

P. K. Saxena, Scientific Consultant—Cyber Security and Former Director, SAG, DRDO, India

P. D. Srivastava, Indian Institute of Technology Bhilai, Raipur, India

Message from Programme Chairs

We are used to the practice of allotting the task of organising the series of ICMC conferences to good institutions spread across the country. This time, we are much pleased to award the task of organising the 10th edition of ICMC 2024 to the KALASALINGAM ACADEMY OF RESEARCH AND EDUCATION-KARE located at a small village in the interior of South Tamil Nadu, Krishnankoil-626126, Tamil Nadu, India. The event was held during January 04–07, 2024, at the KARE University main campus followed by a Pre-Conference Symposium on Advanced Mathematical Methods during January 02–03, 2024. It was organised by the Department of Mathematics of School of Advanced Sciences jointly with the School of Computing. The aim is to provide a common platform for researchers and experts from both Mathematics and Computing to meet, exchange ideas and learn the recent happenings in the respective fields. The speakers are carefully selected to give the best experience to the prospective audience and young researchers. Eighteen speakers from India and abroad delivered their talks, and some of them gracefully accepted to act as session chairs. The response was really wonderful this time to our call for paper through EasyChair. We received 282 papers for the conference. There was an overwhelming response from eminent people of top-class institutions from all over the world. We are fortunate to have 610 members in our Technical Programme Committee. We followed triple blind-review process and carefully selected only 40 articles for publication in the conference proceedings published by the Springer series: *Lecture Notes in Networks and Systems*.

The 10th edition of ICMC 2024 has earned a good repute across countries like India, the USA, Canada, Australia, Japan, France, Germany, China, Indonesia, Turkey, the UAE and Nigeria. The delegates from these countries participated and exchanged their thoughts in a variety of areas of pure mathematics, applied mathematics and computing. We are very thankful to the chief patron, patrons, co-patrons, general chairs, programme chairs, organising chair, speakers, participants, referees, organisers, sponsors and funding agencies for their support and help. Our special thanks to Ramanujan Mathematical Society, Cryptology Research Society of India and Society for Electronic Transactions and Security for coming forward to organise this event jointly with us. Last but not the least, we record here our soulful thanks

to all the volunteers and the workers at the grassroots level who worked tirelessly to make this event a memorable one. A well-planned teamwork was the real reason behind the success of this conference.

New Jersey, USA
Chennai, India
Columbus, USA
Baltimore, USA
Kolkata, India

Jaideep Vaidya
S. Ponnusamy
Zhiqiang Lin
Karuna Pande Joshi
Debasis Giri