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Preface

The Third International Conference on Engineering Mathematics and Computing (ICEMC 2020) was held at the Haldia Institute of Technology, Haldia, West Bengal, India, during 5–7 February 2020. Haldia is a city and a municipality in Purba Medinipur in the Indian state of West Bengal, and Haldia Institute of Technology is a premier institution training engineers and computer scientists for the past several years. It has gained its reputation through its institutional dedication to teaching and research.

In response to the call for papers for ICEMC 2020, 70 papers were submitted for presentation and inclusion in the proceedings of the conference. The papers were evaluated and ranked on the basis of their significance, novelty, and technical quality by at least two reviewers per paper. After a careful blind refereeing process, 19 papers were selected for inclusion in the conference proceedings. The papers cover current research in intelligent systems, soft computing, machine learning, and natural language processing, image and video processing, computer network and security, cryptography, and data hiding, rough set, fuzzy logic, operations research, optimization, uncertain theory and applications, etc. ICEMC 2020 has eminent personalities both from India and abroad (Serbia) who delivered invited talks. The speakers from India are recognized leaders in government, industry, and academic institutions like Indian Statistical Institute, Kolkata, IIT Bombay, Vidyasagar University, etc. All of them are involved in research dealing with the current issues of interest related to the theme of the conference. The conference was one key-note talk by Prof. Siddhartha Bhattacharyya, Christ University, Bangalore, India, and 10 invited talks.

A conference of this kind would not be possible to organize without the full support from different people across different committees. All logistics and general organizational aspects are looked after by the organizing committee members who spent their time and energy in making the conference a reality. We also thank all the technical program committee members and external reviewers for thoroughly reviewing the papers submitted for the conference and sending their constructive suggestions within the deadlines. Our hearty thanks to Springer for agreeing to publish the proceedings in the Studies in Computational Intelligence series.

We are indebted to Haldia Institute of Technology, Haldia, India, for sponsoring the event. Their support has significantly helped in raising the profile of the conference.

Last but not the least; our sincere thanks go to all the authors who submitted papers to ICEMC 2020 and to all speakers and participants. We sincerely hope that the readers will find the proceedings stimulating and inspiring.

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About the Editors

Park Gyei-Kark is Full Professor in the Maritime Transportation of Mokpo National Maritime University (MMU), South Korea. He has been elected as President of the Korea Government Institute of Aids to Navigation for three years since January 2018. He is graduated from the Department of Nautical Science, Korea National Maritime University in Busan and earned his Ph.D. in Systems Science from the Tokyo Institute of Technology, Japan, in 1993. He also is a master in international economics in which he did his second Ph.D. from Chonnam National University, South Korea, in 2010. His fields of interest are maritime information systems and port transportation systems by using fuzzy theory and uncertainty theory. He worked as President of Korea intelligent Systems in 2012 and President of the Korea Association of Port Economics from 2017 to 2018. He has published more than 200 scientific research articles in the field of intelligent systems and maritime economics.

Dipak Kumar Jana is Professor and Head of the Department, School of Applied Science and Humanities, Haldia Institute of Technology, Haldia, West Bengal, India. He did his Ph.D. from the Indian Institute of Engineering Science and Technology, Shibpur, Kolkata, West Bengal, India, and his M.Sc. in applied mathematics with specialization in operations research from Vidyasagar University, West Bengal. As qualified National Eligibility Test (NET-CSIR) for Junior Research Fellow (JRF) and GATE, he has been teaching mathematics to both undergraduate and postgraduate students. He is Member of Operational Research Society of India, Indian Science Congress Association, and Calcutta Mathematical Society.

Professor Jana has published more than 98 papers in several international journals of repute: Journal of Information Science, Journal of Cleaner Production, Applied Soft Computing, Computers and Industrial Engineering, Separation and Purification Technology, International Journal of Uncertainty, Fuzziness and Knowledge-Based Systems, International Journal of Computing Science and Mathematics, Journal of Official Statistics, International Journal of Operations Research, International Journal of Advanced Operations Management, International Journal of Computer Applications, OPESARCH, and Journal of Transportation Security. He has authored eight

books including A Textbook of Engineering Operations Research, GATE Mathematics, Advanced Engineering Mathematics, Advanced Numerical Methods, and Basic Engineering Mathematics. He has also been working as Scholar of Tsinghua University, Beijing.

Prabir Panja is Assistant Professor in the Department of Applied Science and Humanities, Haldia Institute of Technology, Haldia, West Bengal, India. He has completed his Ph.D. degree in mathematical biology from Vidyasgar University, West Bengal, India, in 2017, and M.Sc. in applied mathematics from Vidyasagar University, West Bengal, in 2012, with specialization in operations research. He teaches operations research, numerical analysis, engineering mathematics, discrete mathematics to the undergraduate and postgraduate students. His research areas are mathematical modeling of ecological and epidemiological problems.

Dr. Panja has published more than 25 papers in different reputed international journals, such as Nonlinear Dynamics, Chaos, Solitons and Fractals, Computational and Applied Mathematics, International Journal of Biomathematics, Theory in Biosciences, International Journal of Nonlinear Sciences, and Numerical Simulation. He has contributed two chapters in the book, Mathematical Modeling and Soft Computing in Epidemiology. He is also a reviewer for Applied Mathematics and Computation, Mathematical Biosciences, Nonlinear Dynamics, and International Journal of Biomathematics. He has organized two international conferences: International Conference on Information Technology and Applied Mathematics (in 2019) and International Conference on Engineering Mathematics and Computing (in 2020).

Mohd Helmy Abd Wahab is Senior Lecturer and former Head of Multimedia Engineering Lab and Intelligent System Lab in the Department of Computer Engineering, Faculty of Electrical and Electronic Engineering, Universiti Tun Hussein Onn Malaysia (UTHM) in 2014 and 2009, respectively. He also is Principle Research Fellow, Faculty of Electrical and Electronic Engineering, Advanced Telecommunication Research Center, Japan. Earlier, he was a visiting research fellow at the Center of Excellence on Geopolymer and Green Technology under cluster green ICT, Universiti Malaysia Perlis (UniMAP) from 2018 to 2020. He received Bachelor of Information Technology with Honors from Universiti Utara Malaysia and Master of Science (Intelligent System) from the same university in 2002 and 2004, respectively. He has authored/co-authored two books on database and WAP application and published more than 100 technical papers in conferences and peer-reviewed journals. He also has served as Editor-in-Chief in Advances in Computing and Intelligent System Journal, and the Guest Editor for special issue in "Wireless and Mobile Networks" in the International Journal of Advanced Computer Science and Applications, and Deputy Editor-in-Chief for the International Journal of Software Engineering and Computing. He has also been active committee member on various international conferences, editorial team and has been active manuscript reviewer.

Dr. Wahab has completed several research grants and won several medals in research and innovation showcases. He also has received several teaching awards. He was awarded the 2nd Runner Up for Grand Prize Award Category Innovation

Video Challenge for the project "Online Learning System with Authentication and Identification Mechanism using Neuro-Fuzzy Algorithm," and for the same project, he also received the 1st Grand Prize Award for FB Post and Contest as well as gold medals, respectively at Asia International Innovation Exhibition 2020 (AIINEX2020) organized by Connection Asia and UNIKL. He also received an international award (gold medal) for the project, "Portable Dwi-Switch Home Control Appliance for Elderly and Disabled People," in 2020, in Bangkok, International Intellectual Property, Invention, Innovation and Technology Exposition (IPITEx 2020) in conjunction with Thailand Inventors' Day 2020 from February 2 to 6, 2020.