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Select Proceedings of IICS 2021



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Madhu Sharma Gaur
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International Conference on IoT, Intelligent Computing and Security


Select Proceedings of IICS 2021

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Preface

With the emerging technologies, world is changing and technology intervention is bringing fast paradigm shift in the present era. The rapid development in IoT and intelligent computing technologies are happening day by day, and the things around us are becoming smart and intelligent. These new challenges posed and the ideas generated to solve problems need to be shared. However, this technology transformation is developing with higher security risk which requires discussion to bring awareness about necessary research in the field of intelligent computing and security.

This book presents selected proceedings of the International Conference on IoT, Intelligent Computing and Security: A Paradigm Shift. The Conference IICS-2021 was held on December 17–18, 2021, organized by the department of Master of Computer Applications (MCA), GL Bajaj Institute of Technology and Management, Greater Noida, Delhi NCR, India (affiliated to Dr. A. P. J. Abdul Kalam Technical University, Lucknow, Uttar Pradesh). The conference was conducted in hybrid mode (physical/online) mode due to COVID-19 pandemic.

The aim of IICS-2021 was to bring together vibrant stakeholders who share a passion for research, innovation, solution development partners, end users and our budding professionals around the world to deliberate upon the different challenging aspects and issues in the field of IoT, artificial intelligence, emerging computational intelligence and security solutions.

This two days' online international conference had participation from across the globe including, USA, Australia, France, Argentina, Russia, Nigeria, Norwegian and Bangladesh. The conference received 169 submissions, and review committee received 169 research papers out of which 53 papers were selected for final presentation after rigorous blind reviews involving more than 240 reviewers. The committees of the conference include more than 300 national/international committee chairs, advisory board members, technical program committee members, keynote speakers, presenters and experts from across the globe to share their views, innovations and accomplishments.

We are grateful to Respected Prof (Dr.) S. N. Singh, IIT Kanpur, Chief Guest, Dr. Satish K. Singh, IIIT Allahabad, Dr. Arti Noor, Senior Director, Center of Development in Advanced Computing (C-DAC) Noida, Uttar Pradesh, India, Guest of Honor for their gracious presence and motivation. We pay our heartfelt gratitude to Dr. Ram Kishore Agarwal, Chief Patrons, Shri Pankaj Agarwal, our Patron and our keynote speakers, Dr. Raj Jain, Professor of Computer Science and Engineering, Washington University in St. Louis, Dr. Carlos M. Travieso University of Las Palmas de Gran Canaria (ULPGC), Spain, Dr. K. C. Santosh University of South Dakota, USA, Mr. Daniel Lewis, CEO and Cofounder, Awen Collective (Industrial Cyber Security Software), University of Bristol, Pontypridd, Wales, UK, and Mr. Mitthan Meena, Founder and CEO at Microsec.AI Security for their valuable keynote address on day 1 and day 2.

Our sincerely thanks to all the national/international committee chairs, advisory board members, technical program committee members, keynote speakers, presenters and experts from across the globe and members of the organizing committee for their cooperation, hard work and support to make this conference successful.

We also thank Springer for publishing the proceedings in the Lecture Notes in Electrical Engineering (LNEE) series. Special thanks to all the authors and participants for their contributions in making an effective, successful and productive conference.

Greater Noida, India
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January 2022

Dr. Rajeev Agrawal
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Keynote I

Title: Blockchains with AI for Security and Risk Management

Keynote Address



Dr. Raj Jain

Barbara J. and Jerome R. Cox, Jr., Professor of Computer Science and Engineering, Washington University in St. Louis

Abstract

Blockchains have found numerous applications in Fintech, supply chains and contracts because it is an ideal distributed consensus where all nodes agree on the validity of transactions in a block without needing a central trusted party. The consensus is binary—agree or disagree—true or false. In this era of big data, we need to move blockchains beyond data storage to provide knowledge. In the real world,

there are many situations in which various participants may not fully agree, and their opinions may be probabilistic, leading to probabilistic agreements. In this talk, Prof. Jain will present his recent extensions using AI that allow blockchains to be used for group decisions that may not be binary. These extensions enable blockchains to be used for group decision making and risk management when the group sizes are large, and group members may want to remain anonymous. In particular, Prof. Jain will describe numerous use cases of this idea. Such situations frequently arise in network security and risky investments.

Biography

Raj Jain is currently the Barbara J. and Jerome R. Cox, Jr., Professor of Computer Science and Engineering at Washington University in St. Louis. Dr. Jain is Life Fellow of IEEE, Fellow of ACM, Fellow of AAAS and Recipient of the 2018 James B. Eads Award from St. Louis Academy of Science, 2017 ACM SIGCOMM Life-Time Achievement Award. Previously, he was one of the co-founders of Nayna Networks, Inc., Senior Consulting Engineer at Digital Equipment Corporation in Littleton, Mass, and then Professor of Computer and Information Sciences at Ohio State University in Columbus, Ohio. With 37,000+ citations, according to Google Scholar, he is one of the highly cited authors in computer science. Further information is at <http://www.cse.wustl.edu/~jain/>.

Keynote II

Title: Smart Affective States Identification for Neurodegenerative Diseases

Invited Speaker



Prof. Dr. Carlos M. Travieso-González
University of Las Palmas de Gran Canaria, Spain

Abstract

The use of image processing methods is a useful tool in order to extract information from persons for different application. In particular, soft biometrics application can be applied to detect race, age, gender, expression, etc. In this case, I have used that information to extract the grade of emotions. It can be an important and interesting indicator for medical doctors and to have more diagnostic evidences about a decision or criterion in neurodegenerative diseases.

There is that to difference the concept of expression and the grade of expression or arousal. For this kind of diseases, the important concept is the grade of expression because it says if the person loses or not that grade, with independence of the valence, positive or negative. The neurodegenerative disease is present on the arousal.

This kind of studies can represent new paradigms for the medicine and in great input from the technology field. The adding value of this kind of proposal is its low cost and easy use.

Biography

Carlos M. Travieso-González received the M.Sc. degree in 1997 in Telecommunication Engineering at Polytechnic University of Catalonia (UPC), Spain, and Ph.D. degree in 2002 at University of Las Palmas de Gran Canaria (ULPGC-Spain). He is Full Professor and Head of Signals and Communications Department at ULPGC. He belongs to ULPGC from 2001, teaching subjects on signal processing, pattern recognition and learning theory. His research lines are biometrics, biomedical signals and images, data mining, classification system, signal and image processing, machine learning and environmental intelligence. He has researched in more than 50 International and Spanish Research Projects, some of them as Head Researcher. He is Co-author of four books, Co-editor of 25 Proceedings Book and Guest Editor for eight JCR-ISI international journals and up to 24 chapters. He has over 460 papers published in international journals and conferences (83 of them indexed on JCR–ISI–Web of Science). He has published seven patents in Spanish Patent and Trademark Office. He has been Supervisor on nine Ph.D. theses (11 more are under supervision) and 130 master theses. He is Founder of The IEEE-IWOBI conference series and President of its Steering Committee, of The InnoEducaTIC conference series and of The APPIS conference series. He is Evaluator of project proposals for European Union (H2020 and Horizon Europe), Medical Research Council (MRC—UK), Spanish Government (ANECA), Research National Agency (ANR—France), DAAD (Germany), Argentinian Government and Colombian Institutions. He has been Reviewer in different indexed international journals (<70) and conferences (<240) since 2001. He is Member of IASTED Technical Committee on Image Processing from 2007 and Member of IASTED Technical Committee on Artificial Intelligence and Expert Systems from 2011. He will be APPIS 2020 General Chair and IEEE-IWOBI 2020 and was APPIS 2019 General Chair and IEEE-IWOBI 2019, IEEE-IWOBI 2018 General Chair, APPIS 2018 General Chair, InnoEducaTIC 2017 General Chair, IEEE-IWOBI 2017 General Chair, IEEE-IWOBI 2015 General Chair, InnoEducaTIC 2014 General Chair, IEEE-IWOBI 2014 General Chair, IEEE-INES 2013 General Chair, NoLISP 2011 General Chair, JRBP 2012 General Chair and IEEE-ICCST 2005 Co-chair. He is Associate Editor on Computational Intelligence

and Neuroscience journal (Hindawi—Q1 JCR-ISI), Sensors (MDPI—Q1 JCR-ISI) and Entropy (MDPI—Q2 JCR-ISI). He was Vice-Dean from 2004 to 2010 in Higher Technical School of Telecommunication Engineers in ULPGC and Vice-Dean of Graduate and Postgraduate Studies from March 2013 to November 2017.

Keynote III

Title: Infectious DiseaseX: AI for Healthcare, How BigData is Big, and Explainability

Invited Speaker



Dr. K. C. Santosh
University of South Dakota, USA

Abstract

When we consider AI for healthcare, infectious disease outbreak is no exception. Three major topics: #AI4Healthcare, how #BigData is big (in medical imaging informatics) and #ExplainableAI will be discussed during the talk. The talk will begin with machine learning models that help in not only predicting but also detecting abnormalities due to infectious diseaseX such as pneumonia, TB and COVID-19. I will

open my talk with infectious disease prediction models and unexploited data, where we will learn that predictive analytical tools are close to garbage-in garbage-out (at least for COVID-19). I will then cover multimodal learning and representation based on both shallow learning (handcrafted features) and deep learning (deep features) that typically apply on medical imaging tools. Like in computer vision, I will open an obvious question, how #BigData is big in addition to common techniques: data augmentation and transfer learning. Another crucial part of the talk is #ExplainableAI—I will discuss on where have we missed explainability? With all these facts, as most of models are limited to education and training, I will end up my talk with the statement “ML innovation should not limit to building models.” What we need is #ExplainableAI in #Active Learning framework.

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About the Editors



Dr. Rajeev Agrawal has worked as Director and Professor at G.L. Bajaj Institute of Technology and Management, Greater Noida, India. He has an illustrated experience of more than 27 years in teaching and research and holds a B.E. degree in Electronics Engineering and M.Tech. degree in System Engineering. He received Ph.D. in the area of Wireless Communication Channels from the School of Computer and System Sciences, JNU, New Delhi. He was visiting professor at Kennesaw State University, Georgia, USA, under a joint research project in the area of Remote Patient Monitoring and Medical Imaging. His research areas include planning and performance analysis of wireless networks and medical image analysis for automated diagnosis, performance analysis of fog, and edge networks. He has more than 70 publications in international journals and proceedings. He has been awarded by various state and national agencies for his contribution to research and academics. He is also serving as a reviewer for several reputed international journals and member of the editorial board for two international journals and an editor of a book by Elsevier in the area of Health Informatics and two lecture series by Springer.



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