IEEE

CCCI 2022

2022 IEEE International Conference on Communications, Computing, Cybersecurity and Informatics, CCCI 2022

Will Be Held Virtual
October 17-19, 2022
All Times are based on Beijing, China Local Time

Technical Sponsors:

IEEE

IEEE ComSoc
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CCCI 2022 General Chairs' Message

Welcome to the 2022 IEEE International Conference on Communications, Computing, Cybersecurity, and Informatics (CCCI 2022), which is being held on an annual basis.

The conference was supposed to be held in Dalian, China, but due to COVID-19 situation, here we are holding it virtually.

IEEE CCCI 2022 offers a unique forum for researchers and practitioners from academia, industry, business, and government to share their expertise results and research findings in all areas of Communications, Computing, Cybersecurity and Informatics.

This year's conference includes an outstanding technical program, and distinguished keynote speeches, which will be given by world renowned top scholars/researchers.

CCCI 2022 technical program lasts for 3 days with many sessions. The topics covered in the program are basically in the major theses of Communications, Computing, Cybersecurity and Informatics.

This year, we received a large number of quality papers. Only very high-quality papers have been accepted. The acceptance ratio in the conference is about 47.5 %. This is indicative of the diligent work of the technical program committee chairs, technical program committee members and reviewers. The accepted papers come from all over the World with representation from academia, industry, business and government. Moreover, accepted papers will appear in IEEE Xplore, which usually appear in SCOPUS.

Many individuals have contributed to the success of this high caliber international conference. Our sincere appreciation goes to all authors including those whose papers were not included in the program. Many thanks are also due to our distinguished keynote speakers for their valuable contribution to the conference.

Special thanks are also due to the senior program chair, Prof. Petros Nicopolitidis, for his outstanding role in leading the technical program efforts. Thanks also are due to the other program chairs. Many thanks also go to the technical program committee members and reviewers for their timely work and efforts.

Special thanks go to the publication chairs, Yu Guo for his outstanding work and dedication. Thanks to our dedicated Webmaster Antonio Bueno. Special thanks go to the international publicity committee members and international liaisons for their excellent work.

Special thanks are due to the international steering committee of the CCCI. We also like to thank the IEEE Communication Society for technical co-sponsorship of the conference.

We are grateful to the support of the leadership, faculty and staff of the Dalian University of Science and Technology, for the great efforts, which helped us to have a very successful event.

Finally, on behalf of the 2022 IEEE International Conference on Communications, Computing, Cybersecurity and Informatics (CCCI 2022), we invite all of you to enjoy the program.

Prof. Mohammad S. Obaidat, General Chair,
Life Fellow of IEEE, Fellow of SCS, Past President of the Society for Modeling & Simulation International (SCS), Founding Editor in Chief, Wiley Security and Privacy Journal, Editor in Chief, International Journal of Communication Systems, Recipient of SCS Hall of Fame Award, Recipient of the Technical Achievement Award from IEEE ComSoc-Technical Committee on Communication Software

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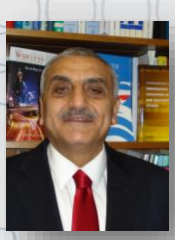

Prof. Mohammad. S. Obaidat

Prof. Qiang Zhang

Prof. Guowei Wu

Prof. Kuei-Fang (Leila) Hsiao

Prof. Petros Nicopolitidis

Dr. Yu Guo

Prof. Chi Lin

Prof. Imad Mahgoub

Prof. Sudeep Tanwar

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Program At a Glance
All Times Listed here are Based on China Local Time

Monday, October 17		Tuesday, October 18		Wednesday, October 19	
Join Zoom Meeting: *		Join Zoom Meeting: *		Join Zoom Meeting: *	
Meeting ID: *		Meeting ID: *		Meeting ID: *	
Passcode: *		Passcode: *		Passcode: *	
12.00-12.30	Opening Session	11.00-12.00	Keynote Speech 5	11.00-12.30	Cybersecurity 1
12.30-13.30	Keynote Speech 1	12.00-13.30	Informatics 1	12.30-14.00	Cybersecurity 2
13.30-14.00	Break	13.30-15.00	Informatics 2	14.00-14.15	Break
14.00-15.00	Keynote Speech 2	15.00-15.15	Break	14.15-15.45	Cybersecurity 3
15.00-16.00	Keynote Speech 3	15.15-16.45	Computing & Communications	15.45-16.15	Closing Session
16.00-17.00	Keynote Speech 4				

- **Info was sent directly to presenting authors - Please do not share the info of ZOOM IDs and Passcodes with anyone except your co-authors.**

Schedule

MONDAY, OCTOBER 17

Daily Program Chair: Prof. Pengfei Wang

12:00 - 12:30

Opening Session

12:30 - 13:30

Keynote Speech 1

Towards the green edge
Session Chair: Prof. Chi Lin

Distinguished Keynote speaker: Prof. Fabrizio Granelli, Univ. of Trento, Italy

Abstract: In recent years, the network edge has attracted wide interest from the scientific and industrial community in communications. Indeed, implementing micro-services at the network edge seems to offer an additional and welcome degree of freedom in the delivery of modern services, allowing to reduce latency, and support high reliability, and location awareness. While the enthusiasm on the subject enabled the already implemented proofs-of-concept of this paradigm, further investigation is still required to better understand the feasibility and scalability of edge solutions, especially in terms of energy efficiency.

This keynote will briefly introduce the building blocks required to understand the concept of the network edge, including Software Defined Networking and Network Function Virtualization. Then, the ETSI Multi-Access Edge Computing standard will be introduced as the reference architecture for service deployment at the edge. Finally, energy-efficient networking and computing concepts and challenges will be analyzed for this interesting scenario.

Bio

Fabrizio Granelli is Full Professor at the Dept. of Information Engineering and Computer Science (DISI) of the University of Trento (Italy). He received the «Laurea» (M.Sc.) and Ph.D. degree from the University of Genoa, Italy, in 1997 and 2001, respectively. He was visiting professor at the State University of Campinas (Brasil) and in 2016 he was visiting professor at the University of Tokyo (Japan). He was IEEE ComSoc Distinguished Lecturer for the period 2012-15 and 2021-22 (3 terms), ComSoc Director for Online Content in 2016-17, Delegate for Education at DISI in 2015-2017, IEEE ComSoc Director for Educational Services (2018-19) and IEEE ComSoc Director for Conference Development (2022-23).

Prof. Granelli was General Chair or TPC Chair of several prestigious IEEE conferences, such as IEEE Globecom, IEEE NFV-SDN, IEEE CAMAD, and chaired several symposia at IEEE ICC and Globecom. He is the Founding Chair of the Aerial Communication Emerging Technology Initiative of IEEE Communications Society and Chair of the IEEE P1954 Standard Working Group.
He is the author or co-author of more than 250 papers published in international journals, books, and conferences.

He is Associate Editor in Chief of IEEE Communications Surveys and Tutorials, and Senior Editor of the IEEE Transactions on Green Communications and Networking.

13:30 - 14:00

Break

14:00 - 15:00

Keynote Speech 2

Edge Intelligence Driven Communication and Computing Resource Coordination
Session Chair: Prof. Pengfei Wang

Distinguished Keynote speaker: Prof.Zhaolong Ning, Dalian Univ. of Technology, China

Abstract: Pervasive Edge Computing (PEC) refers to one kind of edge computing that merely relies on edge devices with sensing, storage and communication abilities to realize peer-to-peer offloading without centralized management. However, on one hand, users may not make appropriate scheduling decisions based on their local observations. On the other hand, how to guarantee the fairness among different edge devices in the fully decentralized environment is rather challenging. In this talk, we first present a multi-agent Imitation learning model in PEC networks, to adapt to the high mobility of users and resolve the shortcomings of the limited storage capacity of edge servers. Then, we propose a remote health monitoring model for Internet of medical things, as an example for delay-sensitive service applications. Highlighting its characteristics, the cost of patients depends on medical criticality, age of information and energy consumption. After that, we propose an imitation learning enabled online task scheduling algorithm with near-optimal performance for Internet of vehicles, as an example for high-concurrency service applications. Specially, an expert can obtain the optimal scheduling policy by solving the formulated optimization problem with a few samples offline.

Bio

Zhaolong Ning received the PhD degree from Northeastern University, China in 2014. He was a research assistant with Kyushu University from 2013 to 2014, Japan, and a Hong Kong Scholar with The University of Hong Kong from 2019 to 2021. Currently, he is a full professor at the Chongqing University of Posts and Telecommunications, China. His research interests include Internet of things, mobile edge computing, and network optimization. He has published more than 120 scientific papers in international journals and conferences, such as IEEE JSAC, IEEE TMC, IEEE TPDS, IEEE T-ITS, IEEE COMST, IEEE COMMAG, IEEE Wireless Communications, and so on. He is the recipient of several prestigious awards including the Best Land Transportation Paper Award of IEEE TVT 2020, Best Paper Award of IEEE Systems Journal 2019 and so on. He serves as an associate editor or guest editor of several journals, such as the IEEE TII and IEEE TCSS. He is a Highly Cited Researcher (Web of Science) and Highly Cited Chinese Researchers (Elsevier) since 2020.

15:00 - 16:00

Keynote Speech 3

Paving the way towards human-centric sensing based NG-IoT systems for smart environments and services: challenges and potential solutions

Session Chair: Prof. Jiankang Ren

Distinguished Keynote speaker: Prof.Malamati Louta, Univ. of Western Macedonia, Greece.

Abstract: Next Generation Internet of Things (NG-IoT) is a promising technology, expected to efficiently incorporate, handle and analyze massive amount of data generated by various end-devices at an unprecedented scale and resolution. Core NG-IoT enabling technologies such as edge computing, 5G and beyond mobile communication systems, distributed ledger / blockchain, virtual / augmented reality and tactile internet are expected to provide promising solutions to a variety of challenges arising from the huge number of devices connected and the amount of data generated, including availability, latency, scalability, energy efficiency, security, privacy, interoperability and reliability.

Involving humans in the loop and bringing them to the forefront in a trusted and sustainable manner is of outmost importance for NG-IoT systems, transforming our society and economy across different domains. However, human presence is still widely ignored by modern IoT systems. Human Centric Sensing, a new paradigm that has emerged in the development of NG-IoT, leverages on the power and wisdom of the crowd, for the benefit of the crowd, efficiently exploiting human intelligence and mobility in conjunction with the proliferation and ubiquity of mobile devices with advanced multi-modal sensing, computing, storage and communication capabilities. People are empowered to contribute data sensed or generated from their mobile devices, enabling efficient (in terms of cost and time) monitoring of large-scale phenomena that could not easily be measured otherwise or would need costly investments in terms of hardware and software. Data mining algorithms are employed to analyze and correlate data, identify spatio-temporal patterns, generate models and make predictions on physical or social phenomena being observed.

In order for HCS based NG-IoT systems to reach their full potential, a number of research challenges should be efficiently addressed, with the security, privacy and data integrity and quality in conjunction with proper incentives that should be in place constituting some of the key aspects and issues raised. Data quality is of critical importance in HCS-based NG-IoT, due to their inherently open nature that make them vulnerable to noisy, obsolete and inaccurate data provisioning. Inadequate and/or low quality data contributions jeopardize the success and affect the quality of the offered crowd sensing based services, while security and privacy concerns are raised as personal information (daily habits, activity patterns) could easily be disclosed. At the same time, incentive mechanisms should be in place so as to promote cooperation and increase users' trust towards data sharing, ensuring this way adequate participation from humans. Aiming to lay the foundations for efficient smart environments and services, a trust-aware HCS-based NG-IoT platform will be discussed as a potential solution to the aforementioned challenges.

Bio

Dr.-Ing. Malamati D. Louta received the M.Eng. and Ph.D. degrees in Electrical and Computer Engineering in 1997 and 2000, respectively, and the M.B.A. degree in 2004 from the National Technical University of Athens. She is Associate Professor and Director of Telecommunication Networks and Advanced Services Laboratory of the Department of Electrical and Computer Engineering, School of Engineering, University of Western Macedonia, Greece. Vice Head of the Department of Electrical and Computer Engineering, School of Engineering, University of Western Macedonia, Greece (2016-2020) and member of the research committee of University of Western Macedonia (2017-2020). She was a researcher at the Telecommunications Laboratory, School of

Electrical and Computer Engineering, National Technical University of Athens (1997-1999), senior engineer – member of the staff of Public Power Corporation (1999-2005), being head of the Information Systems Security subsector (2004-2005), Assistant Professor at the Department of Business Administration, Technological Educational Institute of Western Macedonia (2005-2008), and Lecturer with the Department of Informatics and Telematics, Harokopio University of Athens (2008-2010). Since 2010, as Assistant Professor (2010-2014) and Associate Professor (2014-onward), she is with the Department of Informatics and Telecommunications Engineering, University of Western Macedonia (renamed to Electrical and Computer Engineering in 2019).

Her research interests include telecommunication networks and advanced services engineering. She is the author of over 100 peer-reviewed publications in the above areas. She serves as associate editor (IEEE Communications Magazine, International Journal of Communication Systems -IJCS, Security and Privacy Journal- SPY, Transactions on Emerging Telecommunication Technologies- ETT, WILEY), general chair, technical program committee chair and member, session organizer and a reviewer for a number of international conferences and journals. She serves as a series editor of Artificial Intelligence and Data Science for Communications Series of IEEE Communications Magazine (2020-onwards).

She has contributed to several national and international research and development programs as a researcher, task leader, workpackage leader, principal investigator and coordinator. She is currently participating at 6 research & development programs as a principal investigator and/or coordinator. She is a Senior Member of IEEE since 2014, member of the ACM and the Technical Chamber of Greece

16:00 - 17:00

Keynote Speech 4

Optimizing the initial synchronization procedure in IEEE802.15.4-TSCH networks

Session Chair: Prof. Petros Nicopolitidis

Distinguished keynote speaker: Prof. Christos Douligeris, Univ. of Piraeus, Greece

Abstract: The Industrial Internet of Things (IIoT) is a contemporary research field that is shaping the ground for the automation of industrial processes, the goal of the fourth industrial revolution (Industry 4.0). The need for high reliability and low-power consumption in the applications of IIoT led to the design of mechanisms such as the ‘‘Time Slotted Channel Hopping’’ (TSCH) for the IEEE802.15.4 physical layer. Although TSCH aims to support the stringent requirements of the Industrial Internet of Things, it may lead to long initial synchronization times which in turn leads to long network formation times as well as in an increased energy consumption. In this keynote talk, key optimization techniques that mitigate this issue will be presented.

Bio

Christos Douligeris, currently a professor at the Department of Informatics, University of Piraeus, Greece, held positions with the Department of Electrical and Computer Engineering at the University of Miami. He was an associate member of the Hellenic Authority for Information and Communication Assurance and Privacy and the President and CEO Hellenic Electronic Governance for Social Security SA. Dr. Douligeris has published extensively in the networking scientific literature and he has participated in many research and development projects. His main research interests lie in the areas of computer networking, communications, network security, cyber security, web science, data analytics, new technologies in education and emergency response operations.

TUESDAY, OCTOBER 18

Daily Program Chair: Prof. Chi Lin

11:00 - 12:00

Keynote Speech 5

IoT, Smart Home and Smart City: From Sensors to computing

Session Chair: Dr. Yunming Xiao

Distinguished keynote speaker: Prof. Subhas Chandra Mukhopadhyay, Macquarie University, Australia

Abstract: The advancements in electronics, embedded controllers, smart communicating devices as well as the progress towards a better informed, knowledge based society increase the demand for small size, affordable sensors that allow accurate and reliable data recording, processing, storing and communication. This led to the paradigm known as Internet of Things (IoT) in which Wireless Sensor Nodes are most important elements.

The seminar will present research activities on development of IoT based system towards managing our health, home and environment in a better way. The successful system needs a combined effort of sensing, communication, security and data informatics. Recent work on sensors for Smart city and water applications will be shared.

Bio

Subhas holds a B.E.E. (gold medallist), M.E.E., Ph.D. (India) and Doctor of Engineering (Japan). He has over 32+ years of teaching, industrial and research experience.

Currently he is working as a Professor of Mechanical/Electronics Engineering, Macquarie University, Australia and is Discipline Leader of the Mechatronics Engineering Degree Programme. He is Director of International Engagement of School of Engineering. His fields of interest include Smart Sensors and sensing technology, instrumentation techniques, wireless sensors and network, IoT etc. He has supervised over 55 postgraduate students and over 150 Honours students. He has examined over 75 postgraduate theses.

He has published over 500 papers in different international journals and conference proceedings, written ten books and fifty two book chapters and edited eighteen conference proceedings. He has also edited thirty five books with Springer-Verlag and thirty journal special issues. He has organized over 20 international conferences as either General Chairs/co-chairs or Technical Programme Chair. He has delivered 415 presentations including keynote, invited, tutorial and special lectures.

He is a Fellow of IEEE (USA), a Fellow of IET (UK), a Fellow of IETE (India), a Topical Editor of IEEE Sensors journal, and an associate editor of IEEE Transactions on Instrumentation and Measurements, IEEE Review of Biomedical Engineering, IoP Measurement Science and Technology. He is a Distinguished Lecturer of the IEEE Sensors Council from 2017 to 2022. He was the Founding chair of IEEE IMS NSW chapter and is the Founding chair of IEEE NSW Sensors Council Chapter.

More details can be available at
http://web.science.mq.edu.au/directory/listing/person.htm?id=smukhopa
https://scholar.google.com/citations?user=bpwXxYEAAAAJ&hl=en

12:00 - 13:30

Informatics 1

Session Chair: Dr. Qiwei Wang

Medium and Short-Term Prediction of Power System Load Based on Improved LSTM Algorithm
Shuo Yang; Jiahao Yang; Xiaoting Wang; Xianshi Ge

An Efficient Authentication Technique Using Convolution Chebyshev Chaotic Maps for TMIS
Chandrashekhar Meshram; Agbotiname Lucky Imoize; Ismail Bahkali; Parkash Tambare

A Rotation Speed Measurement System Based on Millimeter Wave
Song Zijun; Qiwei Wang

13:30 - 15:00

Informatics 2

Session Chair: Dr. Yu Sun

Examining the Influence of National Digital Identity and Smart Pass Platform on Accelerating the Processes of Digital Transformation
Abdelrahman Ahmed Alhammadi; Mohammed Lataifeh

Internet-Of-Explainable-Digital-Twins: A Case Study of Versatile Corn Production Ecosystem
Pronaya Bhattacharya; Mohammad S. Obaidat; Sakshi Sanghavi; Vatsal Sakariya; Sudeep Tanwar

Exploring the Relationship Between IT Competence and Digital Transformation Within Government Projects in the UAE
Abdelrahim Ismail Alzarooni; Mohammad Lataifeh

Research on CNN-SVM Method for Gastroscopic Image Detection
Wenjie Chen

15:00 - 15:15

Break

15:15 - 16:45

Computing & Communications

Session Chair: Prof. Petros Nicopolitidis

Scheduling Tightly Coupled Parallel Jobs with Runtime-Extended Tasks on Distributed Resources
Georgios L. Stavrinides; Helen Karatza

A Quality of Service Aware VM Placement for User Applications in Cloud Data Center
Arash Hadadi; Alireza Shameli Sendi

A Novel Objective Video Quality Assessment Metric for Cloud Gaming Applications
Nafi Ahmad; Abdul Wahab; John Schormans; Ali Adib Arnab

WEDNESDAY, OCTOBER 19

Daily Program Chair: Prof. Pengfei Wang

11:00 - 12:30

Cybersecurity 1

Session Chair: Dr. Kang Yang

On the Security of Authenticated Key Agreement Schemes for e-Healthcare
Abhijit Kasi; Purva Rewal; Dheerendra Mishra; Kuei-Fang Hsiao

Secure Transmission in Cell-Free Massive MIMO Network with Phase Noise
Xianyu Zhang; Tao Liang; Kang An; Xiaoqiang Qiao; Xiaoyu Wang

Fraud Detection During Financial Transactions Using Machine Learning and Deep Learning Techniques
Mahbuba Yesmin Turaba; Md. Mehedi Hasan; Md. Nazrul Islam Khan; Hafiz Abdur Rahman

12:30 - 14:00

Cybersecurity 2

Session Chair: Dr. Ann Move Oguti

Transfer Learning Approach to Discover IDS Configurations Using Deep Neural Networks
Abdulmonem Alshahrani; John Clark

BeHAutH: A KNN-Based Classification Scheme for Behavior-Based Authentication in Web 3.0
Pronaya Bhattacharya; Chandan Trivedi; Kartik Patel; Sudeep Tanwar; Kuei-Fang Hsiao

An Efficient Digital Short Signature Scheme Using CCM for HC-IoT Environments
Chandrashekhar Meshram; Mohammad S. Obaidat; Agbotiname Lucky Imoize; Ismail Bahkali; Akshaykumar J Meshram; Kuei-Fang Hsiao

14:00 - 14:15

Break

14:15 - 15:45

Cybersecurity 3

Session Chair: Zhaohong Yan

On the Security of Content Key Distribution Framework for DRM Systems
Purva Rewal; Abhijit Kasi; Mohammad S. Obaidat; Dheerendra Mishra; Ankita Mishra

FedADSN: Anomaly Detection for Social Networks Under Decentralized Federated Learning
Yikuan Chen; Li Liang; Wei Gao

GaitPretreatment: Robust Pretreatment Strategy for Gait Recognition
Yuanyuan Han; Wang Zhong; Xin Han; Xiaoya Fan

15:45- 16:15

Closing Session