

The 20th International Conference on Ubiquitous Computing and Communications (IUCC-2021)

The 20th International Conference on Computer and Information Technology (CIT-2021)

The 4th International Conference on Data Science and Computational Intelligence (DSCI-2021)

The 11th International Conference on Smart Computing, Networking, and Services (SmartCNS-2021)

Online Conference, 20-22 December 2021 (Greenwich Mean Time Zone)

Conference Program and Information Booklet

Sponsored by



Advanced Program Summary (Greenwich Mean Time Zone)

20 December 2021 (Monday)

Room	Room-1	
08:45-09:00	Opening Ceremony	
09:00-09:45	Keynote Speech 1	
09:45-10:30	Keynote Speech 2	
10:30-10:40	Break	
10:40-11:25	Keynote Speech 3	
11:25-12:10	Keynote Speech 4	
12:10-12:40	Lunch Break	
Room	Room-1	Room-2
12:40-14:20	IUCC-1	IUCC-3
14:20-14:30	Break	
14:30-16:30	IUCC-2	IUCC-4

21 December 2021 (Tuesday)

Room	Room-1	
09:00-09:45	Keynote Speech 5	
09:45-10:30	Keynote Speech 6	
10:30-10:40	Break	
10:40-11:25	Keynote Speech 7	
11:25-12:10	Keynote Speech 8	
12:10-12:40	Lunch Break	
Room	Room-1	Room-2
12:40-14:40	CIT-1	CIT-3
14:40-14:50	Break	
14:50-16:10	CIT-2	CIT-4

22 December 2021 (Wednesday)

Room	Room-1	Room-2
08:30-10:10	DSCI-1	DSCI-2
10:10-10:20	Break	
10:20-12:00	DSCI-3	DSCI-4
12:00-12:30	Lunch Break	
12:30-14:10	DSCI-5	SmartCNS-1
14:10-14:20	Break	
14:20-16:20	SmartCNS-2	SmartCNS-3

Presentation Guidelines

Conference Date

The conference is to be held from Dec 20-22, 2021. The time for conference program is based on **GMT, Greenwich Mean Time**.

For Session Chairs

Session Chairs are requested to join the zoom at least 10 minutes before their session.

For Authors

You are strongly encouraged to join the zoom during your presentation and Q&A. Please confirm your attendance with the Session Chair at least 10 minutes before the session.

Timing

Please ensure you check the program for the exact time of your session and where your paper falls within the session.

It is recommended that all IUCC/CIT/DSCI/SmartCNS paper presentations use **15 minutes presentation time plus 5 minutes question time**. However, the Session Chairs will determine the exact presentation time for each paper, based on the number of presentations in each session. The Session Chairs will ensure that you do not over-run the time allocated.

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[Monday, 20 December 2021 | 09:00-09:45 \(London Time\)](#)[Monday, 20 December 2021 | 17:00-17:45 \(Beijing Time\)](#)[Monday, 20 December 2021 | 04:00-04:45 \(New York Time\)](#)

Session Chair: Jia Hu, University of Exeter, UK

Keynote Speech 1

Are we safe to move into a highly automated society?

Prof Wen-Hua Chen

Loughborough University, UK

Abstract

Driverless cars, unmanned aircraft, fully automated mining in deep ground/sea, and healthcare robots looking after elder and disabled people — these are hot words we are seeing daily in the media, and discussed and debated at home and pubs. There is a huge aspiration about future highly automated society driven by advances in computer and information technology, particularly mobile communication, data science and artificial intelligence. But are we ready for that? Are they safe? This talk will discuss some key enabled technologies involved in these highly automated systems, the progress and the remaining challenges. It argues that a significant progress has been made in individual functions such as perception and decision making, but more is required in understanding their interactions and their influence on the overall performance and safety at a system level. It is essential to develop tools for efficient design and analysis, and safeguarding the behaviour of these highly automated systems. Examples including agent planning and autonomous source search are discussed to illustrate interaction between perception, optimisation, system dynamics and operation environment.

Biography



Dr Wen-Hua Chen holds Professor in Autonomous Vehicles in the Department of Aeronautical and Automotive Engineering at Loughborough University, UK. Prof. Chen has a considerable experience in control, signal processing and artificial intelligence and their applications in aerospace, automotive and agriculture systems. In the last 15 years, he has been working on the development and application of unmanned aircraft system and intelligent vehicle technologies, spanning autopilots, situational awareness, decision making, verification, and remote sensing for precision agriculture and environment monitoring. His unmanned vehicles related research is widely supported by the UK government and industry. He is a Chartered Engineer, and a Fellow of IEEE, the Institution of Mechanical Engineers, and the Institution of Engineering and Technology, UK. Recently Prof Chen was awarded the prestigious EPSRC (Engineering and Physical Science Research Council) Established Career Fellowship to develop advanced analysis and design tools for safe operation of robotics and autonomous systems.

Session Chair: Jia Hu, University of Exeter, UK

Keynote Speech 2

Bruce Lee inspired Fluid Antenna Systems for 6G

Prof (Kit) Kai-Kit Wong

University College London, UK

Abstract

“Be formless ... shapeless, like water!”, which were the words used by Bruce Lee, as he was revealing the philosophy of Jeet Kune Do, the martial arts system Lee founded in 1967. Many parallels can be drawn in wireless communications technologies where engineers have been seeking greater flexibility in using the spectral and energy resources for improving network performance. In this talk, I will speak on a novel antenna technology, referred to as fluid antenna, that adopts a software-controlled, position-flexible antenna to operate on the best signal envelope within a given space. This talk presents some preliminary results on fluid antenna systems, which shows great promises on massive connectivity for 6G.

Biography



(Kit) Kai-Kit Wong received the BEng, the MPhil, and the PhD degrees, all in Electrical and Electronic Engineering, from the Hong Kong University of Science and Technology, Hong Kong, in 1996, 1998, and 2001, respectively. He is Chair Professor of Wireless Communications at the Department of Electronic and Electrical Engineering, University College London, UK. His current research centers around 5G and beyond mobile communications. He is a co-recipient of the 2020 Premium Award for Best Paper in IET Electronics Letters, the 2013 IEEE Signal Processing Letters Best Paper Award, the 2000 IEEE VTS Japan Chapter Award at the IEEE Vehicular Technology Conference in Japan in 2000, and a few other international best paper awards. He is Fellow of IEEE and IET. He is the Editor-in-Chief for IEEE Wireless Communications Letters since 2020, and also the Subject Editor-in-Chief for Wireless Communications of IET Electronics Letters since June 2020.

Session Chair: Geyong Min, University of Exeter, UK

Keynote Speech 3

Scalable Deep Learning from Big Data

Prof. Liangxiu Han

Manchester Metropolitan University, UK

Abstract

In recent years, deep learning has attracted much attention due to its' nature in discovering correlation structure in data in an unsupervised fashion and has been applied into various domains such as in speech recognition and image classification, nature language processing and computer vision. In typical neural networks, it requires large-scale data to learn parameters (often reach to millions), which is a computationally intensive process and takes a lot of time to train a model. Scalable deep learning is therefore much needed, which can train complex models over a vast amount of data, allowing for optimal training performance in terms of computing time and accuracy. This talk will focus on the latest developments and real-world applications of scalable deep learning from big data.

Biography



Prof. Liangxiu Han has a PhD in Computer Science from Fudan University, Shanghai, P.R. China (2002). Prof. Han is currently a Professor of Computer Science at the Department of Computing and Mathematics, Manchester Metropolitan University. She is a co-Director of Centre for Advanced Computational Science and Deputy Director of ManMet Crime and Well-Being Big Data Centre. Han's research areas mainly lie in the development of novel big data analytics/Machine Learning/AI, and development of novel intelligent architectures that facilitates big data analytics (e.g., parallel and distributed computing, Cloud/Service-oriented computing/data intensive computing) as well as applications in different domains (e.g. Precision Agriculture, Health, Smart Cities, Cyber Security, Energy, etc.) using various large scale datasets such as images, sensor data, network traffic, web/texts and geo-spatial data. As a Principal Investigator (PI) or Co-PI, Prof. Han has been conducting research in relation to big data/Machine Learning/AI, cloud computing/parallel and distributed computing (funded by EPSRC, BBSRC, Innovate UK, Horizon 2020, British Council, Royal Society, Industry, Charity, respectively, etc.).

Prof. Han has served as an associate editor/a guest editor for a number of reputable international journals and a chair (or Co-Chair) for organisation of a number of international conferences/workshops in the field. She has been invited to give a number of keynotes and talks on different occasions (including international conferences, national and international institutions/organisations).

Prof. Han is a member of EPSRC Peer Review College, an independent expert for Horizon 2020 proposal evaluation/mid-term project review, and British Council Peer Review Panel.

Session Chair: Geyong Min, University of Exeter, UK

Keynote Speech 4

Efficient Federated Learning: Current Solutions and Open Challenges

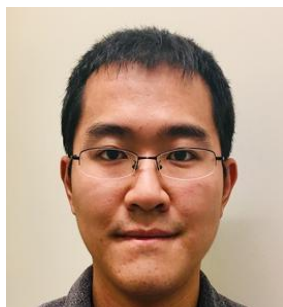
Dr. Shiqiang Wang

IBM T.J. Watson Research Center, US

Abstract

Federated learning (FL) is an emerging technique for model training from decentralized data. Compared to learning from data in a central storage, FL has benefits of privacy preservation and communication bandwidth reduction. A challenge in FL is that data and model characteristics can vary largely across different tasks, and an FL task with improper configuration could waste a lot of computation/communication resources and may cause the trained model to diverge from the optimal result. In this talk, I will first give an overview of FL. Then, I will present a few adaptive FL methods that learn near-optimal configurations (e.g., synchronization interval, compressed model size) over time during the FL process, to reach the best model accuracy with the smallest amount of training time. In the end, I will discuss some open problems and challenges in FL and also the broad area of edge AI.

Biography



Shiqiang Wang is a Research Staff Member at IBM T. J. Watson Research Center, NY, USA. He received his Ph.D. from Imperial College London, United Kingdom, in 2015. His current research focuses on the intersection of distributed computing, machine learning, networking, and optimization. He has made foundational contributions to edge computing and federated learning that generated both academic and industrial impact. Dr. Wang serves as an associate editor of the IEEE Transactions on Mobile Computing. He has also been actively organizing workshops at the intersection of edge computing and machine learning, and regularly participates in technical program committees (TPCs) of prominent conferences and review panels of research grants. He

received the IEEE Communications Society Leonard G. Abraham Prize in 2021, IBM Outstanding Technical Achievement Award (OTAA) in 2019 and 2021, multiple Invention Achievement Awards from IBM since 2016, Best Paper Finalist of the IEEE International Conference on Image Processing (ICIP) 2019, and Best Student Paper Award of the Network and Information Sciences International Technology Alliance (NIS-ITA) in 2015. For more details, please visit: <https://shiqiang.wang/>

Session Chair: Pablo Casaseca, University of Valladolid, Spain

Keynote Speech 5

Monitoring of people mobility by looking at our devices' WiFi probe frames

Prof. Luigi Atzori

University of Cagliari, Italy

Abstract

The knowledge on how people move in urban areas is of key importance for the implementation of major city management tasks, such as: planning public transport services; safety management during major city events; analyzing the influence of public areas on city quality of life. With reference to this context, this talk illustrates how the WiFi management frames sent by our devices can be observed to develop a passive solution to collect meaningful data. Herein, the major challenge is to de-randomize the MAC addresses which are frequently changed by our devices for privacy reasons. It consists in clustering frame messages which are probably sent by the same physical device. Key mobility indicators can be extracted from this method: crowd density per area of interest, people flows, recurrent mobility patterns, and mobility heat maps. A dataset for further improving the algorithm performance is also presented.

Biography



Luigi Atzori (PhD, 2000) is professor of Telecommunications at the University of Cagliari, where he leads the activities of the Net4U laboratory (Networks for Humans) with around 20 affiliated researchers. Since 2018, he has been the coordinator of the master degree course in Internet Technology Engineering at the University of Cagliari. His research interests fall in the area of Internet of Things (IoT), with particular reference to the design of effective algorithms for the realization of social networks among connected devices to create the Social IoT paradigm. His interests also falls in the area of Quality of Experience (QoE), with particular application to the management of services and resources in new generation networks for multimedia communications. Lately, he also applies the study of QoE to IoT services. He is the founding partner of the GreenShare spinoff where he currently serves as CIO; the company provides IoT services in the sustainable mobility sector. He is a regular reviewer for the EU and for Irish, Spanish and Swedish research programs. He has been the coordinator of European projects in the areas of QoE and IoT (QoE-Net, Demanes and Netergit). He serves regularly in the conference organizing committee of the sector and as associate and guest editor of several international journals (such as IEEE IoT journal, Ad Hoc Networks, IEEE Open Journal of the Communications Society, IEEE Communications Magazine).

Session Chair: Pablo Casaseca, University of Valladolid, Spain

Keynote Speech 6

Provision of Data-Centric Services for Artificial Intelligence of Things

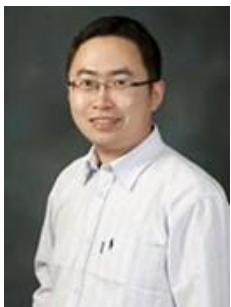
Prof Lu Liu

University of Leicester, UK

Abstract

Given the recent proliferation in the number of smart devices connected to the Internet, the era of Artificial Intelligence of Things (AIoT) is challenged with massive amounts of data generation and data-centric service provision. Edge Computing is gaining popularity and is being increasingly deployed in various latency-sensitive application domains. However, efficient provision and management of data-centric services are one of the prevailing challenges in the era of AIoT with Smart Edge Computing. To address this challenge, Professor Liu will introduce his recent research work on data-centric service model design with the process of how to adaptively index services, how to efficiently discover services, how to securely request services and finally dependably integrate services in a dynamic environment. Professor Liu will further present his work on data-centric service application development for engineering data analytics, social data analytics, workload data analytics and commercial data analytics.

Biography



Professor Lu Liu is the Head of School of Computing and Mathematical Sciences at the University of Leicester, UK. Professor Liu received his PhD degree from Surrey Space Centre at the University of Surrey, UK. Professor Liu's research is in the areas of data science, service computing, cloud computing and the Internet of Things and he has over 200 scientific publications in reputable journals, academic books and international conferences. Professor Liu has secured many research projects which are supported by research councils, BIS, Innovate UK, British Council and leading industries. He has been the recipient of seven Best Paper Awards from international conferences and was invited to deliver seven keynote speeches at international conferences. Professor Liu is a Fellow of BCS (British Computer Society). He currently serves as an Editorial Board member of 6 international journals and has chaired over 20 international conferences.

Session Chair: Fei Hao, Shaanxi Normal University, China

Keynote Speech 7

Wearable Emotion Sensing for Human-Machine Interaction

Prof. Hui Yu

University of Portsmouth, UK

Abstract

With the increasing demand of machine intelligence across a wide range of application scenarios, human-machine interaction (HMI) emerges as another essential communication, whereby facial-expression-aware is one of the principal features for natural interaction. The principal branch of my research was driven by these thoughts: combining knowledge of creative technologies with multiple disciplines, such as psychology, cognition, visual computing, computer graphics and machine learning. Particularly, biometric data precisely record the facial muscle activity or brain activity closely related to facial movements and the internal emotional states. These multiple sensing channels would help provide an insight into the emotion and perception of facial expression, to develop widely accessible HMI solutions able to track facial motions, and recognise affective states in a highly efficient and precise manner. This talk will discuss the development of visual facial data and electromyogram (EMG) processing for emotion detection with the application focusing on VR/AR.

Biography



Hui Yu is a Professor with the University of Portsmouth, UK. He is the Head of the Visual Computing Group at the university. His main research interest lies in visual computing, particularly in understanding and sensing emotion and the visual information of human related issues with semantic interpretation. It involves and develops knowledge and technologies in vision, machine learning, virtual reality, brain-computer interaction and robotics. Professor Yu's research work has led to several awards and successful collaboration with worldwide institutions and industries. Prof. Yu is Scientific Advisor for some high-tech companies in the UK. Prof. Yu is the PI on grants from a diverse range of funding sources including the EPSRC, EU FP7, RAEng, Royal Society, Innovate UK and Industry. He has been awarded Industrial Fellowship by the Royal Academy of Engineering. He serves as Associated Editor of IEEE Transactions on Human-Machine Systems, IEEE Transactions on Computational Social Systems and Neurocomputing journal.

Session Chair: Zhiwei Zhao, University of Electronic Science and Technology of China, China

Keynote Speech 8

Data Analytics for Smart Energy Cyber-Physical System Security

Prof. Shiyan Hu

University of Southampton, UK

Abstract

The massive deployment of advanced metering infrastructures has mandated a transformative shift of the classical power grid towards a more reliable smart grid. However, such a cyber-physical power system is vulnerable to various cyberattacks. In this talk, I will describe a systematic machine learning and data analytics framework, which is based on partially observable Markov decision process, orthogonal matching pursuit, and empirical mode decomposition, to detect anomaly energy usage behavior through analyzing the massive smart meter data. I will also discuss how this framework can be used to detect smart grid cyberattacks such as energy theft. I will conclude the talk with some of the ongoing research in this direction.

Biography



Prof. Shiyan Hu received his Ph.D. in Computer Engineering from Texas A&M University in 2008. He is the Professor and Chair of Cyber-Physical System Security at University of Southampton, where he is Director of Cyber Security Academy. His research interests include Cyber-Physical Systems (CPS) and CPS Security, where he has published more than 150 refereed papers, including 60+ in IEEE Transactions. Prof. Hu is an ACM Distinguished Speaker, an IEEE Systems Council Distinguished Lecturer, a recipient of U.S. National Science Foundation CAREER Award, and a recipient of IEEE Computer Society TCSC Middle Career Researcher Award. His publications have received a few distinctions such as the 2018 IEEE Systems Journal Best Paper Award, the 2017 Keynote Paper in

IEEE Transactions on Computer-Aided Design, the March 2014 Front Cover Paper in IEEE Transactions on Nanobioscience, multiple Thomson Reuters Highly Cited Papers, etc. He is the Chair for IEEE Technical Committee on Cyber-Physical Systems and the Editor-in-Chief of IET Cyber-Physical Systems: Theory & Applications. He has served as the 2020 Editor-in-Chief Search Committee Chair for ACM Transactions on Design Automation of Electronic Systems. He is an Associate Editor for IEEE Transactions on Computer-Aided Design, IEEE Transactions on Industrial Informatics, IEEE Transactions on Circuits and Systems II, ACM Transactions on Design Automation of Electronic Systems, ACM Transactions on Cyber-Physical Systems, and a Guest Editor for 8 IEEE/ACM journals including Proceedings of the IEEE (PIEEE) and IEEE Transactions on Computers. He has held chair positions in various IEEE conferences. He is a Member of European Academy of Sciences and Arts, a Fellow of IET, and a Fellow of British Computer Society. More information about him is at <http://personal.southampton.ac.uk/sh2e19/>.

20 December 2021 Monday

12:40-14:20 Session IUCC-1: Ubiquitous Computing (Room-1)

Session Chair: Rongqi Zhang, Nanjing University

[Monday, 20 December 2021 | 12:40-14:20 \(London Time\)](#)

[Monday, 20 December 2021 | 20:40-22:20 \(Beijing Time\)](#)

[Monday, 20 December 2021 | 07:40-09:20 \(New York Time\)](#)

Back-Imaging Scheme in RF-powered Passive Camera System

Yingqi Chen, Liang Liu, Yu Sun, Pengfei Wang, Guowei Wu, Lei Wang, Chi Lin

VPP: A Communication Schema for Population Protocols in VANET

Antonio Bordonaro, Alessandra De Paola, Giuseppe Lo Re

Proactive Attack Detection at the Edge through an Ensemble Deep Learning Model

Panagiotis Fountas, Maria Papathanasaki, Kostas Kolomvatsos, Nikos Tziritis

A Secure Federated Learning Mechanism for Data Privacy Protection

Hui Lin, Wenxin Liu, Xiaoding Wang

QoE Models for Online Video Streaming

Rongqi Zhang, Xu Zhang, Peiyao Guo, Qilin Fan, Hao Yin, Zhan Ma

14:30-16:30 Session IUCC-2: Ubiquitous Communications (Room-1)

Session Chair: Haozhe Wang, University of Exeter

[Monday, 20 December 2021 | 14:30-16:30 \(London Time\)](#)

[Monday, 20 December 2021 | 22:30-00:30\(+1\) \(Beijing Time\)](#)

[Monday, 20 December 2021 | 09:30-11:30 \(New York Time\)](#)

OFDM Signal Design Based on Electrode-Based Through-The-Earth Communication

Gan Zhang, Zhan Xu, Jinhui Chen, Xiaowen Wen

The Impact of Routing Protocols on the Performance of TCP in VANETs

Abdelkader Ralem Ahmed, Mohamed Ould-Khaoua

4-ary CSK Modulation Scheme Better than RGBW for LCD-Screen Camera Communications

Alex Cartagena Gordillo

Spiking Mean Field Multi-Agent Reinforcement Learning for Dynamic Resources Allocation in D2D Networks

Peigen Ye, Wei Liang, Rongfang Xiao, Qiang Lu, Zhongyong Guo, Kaixiang Sun

Joint Optimization of Latency and Reward for Offloading Dependent Tasks in Mobile Edge Computing

Yanqi Gong, Fei Hao, Yifei Sun, Longjiang Guo

Energy-Efficient Power Control and Resource Allocation Based on Deep Reinforcement Learning for D2D Communications in Cellular Networks

Sami Alenezi, Chunbo Luo

12:40-14:20 Session IUCC-3: Ubiquitous System, Services and Applications (I) (Room-2)

Session Chair: Haozhe Wang, University of Exeter

[Monday, 20 December 2021 | 12:40-14:20 \(London Time\)](#)

[Monday, 20 December 2021 | 20:40-22:20 \(Beijing Time\)](#)

Monday, 20 December 2021 | 07:40-09:20 (New York Time)

DcNetCache: Datacenter In-Network Caching for Large-Scale Key-Value Stores
Yingwu Zhu

A Fuzzy Bayesian Network Based on Fault Tree for Vaccine Safety Risks Analysis
Muzhou Hou, Dan Xiong, Xiaoliang Xie, Guo Wei

A Reinforcement Learning-based Task Classification Mechanism for Privacy-Enhanced Mobile Crowdsensing Strategy
Mengyao Peng, Hui Lin, Xiaoding Wang

A Mobile Crowd Sensing Ecosystem based on Fog Computing Infrastructure
Liwei Lin, Xia Lin, Xiaoding Wang

Preserving Privacy for Edge Weights in Communication Networks
Jiaru Wang, Yanze Huang, Limei Lin

14:30-16:30 Session IUCC-4: Ubiquitous System, Services and Applications (II) (Room-2)

Session Chair: Yang Chi, Dalian University of Technology

Monday, 20 December 2021 | 14:30-16:30 (London Time)

Monday, 20 December 2021 | 22:30-00:30(+1) (Beijing Time)

Monday, 20 December 2021 | 09:30-11:30 (New York Time)

IoTVT Model: A Model Mapping IoT Sensors to IoT Vulnerabilities and Threats
Mathew Nicho, Shini Girija

Design and Implementation of Anti-wireless Electricity Rubbing System
Qiwei Wang

Design and Animate the Representative 3D Model of Soothsayer of the Shang Dynasty
Hong Yang, Qing-Sheng Li, Gui-Li Tao, Xiao-Xiao Cao

Design and Implementation of Smart Bracelets Mutual Authentication System
Qiwei Wang

Instrumented Activity Dice for Assessing Throwing Performance: A Pilot Study
Seethu M Christopher, Rico Möckel

21 December 2021 Tuesday

12:40-14:40 Session CIT-1: Artificial Intelligence and Data Science (Room-1)

Session Chair: Junfeng Wu, Dalian Ocean University

[Tuesday, 21 December 2021 | 12:40-14:40 \(London Time\)](#)

[Tuesday, 21 December 2021 | 20:40-22:40 \(Beijing Time\)](#)

[Tuesday, 21 December 2021 | 07:40-09:40 \(New York Time\)](#)

CAN Reverse Engineering based on the Differential Method

Sixian yu, Guoai Xu, Zixiang Bi, Guosheng Xu

Dynamic Gesture Recognition based on Multimodal Fusion Model

Juan Fang, Chao Xu Chao Wang, Hua Li

A Novel Fish Counting Method with Adaptive Weighted Multi-Dilated Convolutional Neural Network

Junfeng Wu, Yizhi Zhou, Hong Yu, Yuxuan Zhang, Jiang Li

Classify Project Programming Languages (PLP) in GitHub: Clustering in Machine Learning

Faten Slama, Imen Ismail, Ilassaad latrach

Prediction Method of Underground Density Abnormal Body in Gravity Data Based on Convolutional Neural Network

Rui Wang, Chi Wang, Zhengwei Xu, Hua Li, Yuxin Zhang, Qiang Li, Ziyue Wang

An Underwater Fish Individual Recognition Method Based on Improved YoloV4 and FaceNet

Huanjun Zhang, Junfeng Wu, Hong Yu, Weifang Wang, Yuxuan Zhang, Yizhi Zhou

14:50-16:10 Session CIT-2: Reliable Wireless Communications (Room-1)

Session Chair: Oluyomi Simpson, University of Hertfordshire

[Tuesday, 21 December 2021 | 14:50-16:10 \(London Time\)](#)

[Tuesday, 21 December 2021 | 22:50-00:10\(+1\) \(Beijing Time\)](#)

[Tuesday, 21 December 2021 | 09:50-11:10 \(New York Time\)](#)

Simulating Network Link Compression in Loss-less Wireless Sensor Networks (WSNs) Environment

Rozita Teymourzadeh, Ramona Carmen Stoica, Robert Chang, Vahab Pournaghshband

Optimization Strategy of Satellite Signal Processing Software based on Feiteng FT-2000 Computing Board

Keyu Wu, Fengge Wu, Junsuo Zhao

Low-Complexity Lattice Reduction Aided Schnorr Euchner Sphere Decoder Detection Schemes with MMSE and SIC Pre-processing for MIMO Wireless Communication Systems

Goodwell Kapfunde, Oluyomi Simpson, Yichuang Sun

Modeling Short-form Video Transfer in Information Centric Network

Han Xu, Haozhe Wang, Jia Hu

12:40-14:40 Session CIT-3: Information Technology and Smart Health (Room-2)

Session Chair: Wang Miao, University of Exeter

[Tuesday, 21 December 2021 | 12:40-14:40 \(London Time\)](#)

[Tuesday, 21 December 2021 | 20:40-22:40 \(Beijing Time\)](#)

[Tuesday, 21 December 2021 | 07:40-09:40 \(New York Time\)](#)

An Automatic Method for Identifying the Microscopic Feature of Ray-cell Number

Qizhao Lin, Hong Wang, Wenyin Chen, Jian Qiu, Yong Guo

A Supporting System for Implementing an Evaluation Model of Classroom Teaching Quality Based on Students' Self-estimation
Lianqiang Niu, Kunpeng Wang, Shengnan Zhang, Jiawei Zheng, Gang Xu

A Study on the Creation of 3D Models of Cultural Properties by SfM Using an Elaborate Diorama of a Non-Existing Excavation Site
Miki Sugano, Wanpeng Shao, Ken'ichi Kakizaki, Shunsuke Araki

The Effects of Regularisation on RNN Models for Covid-19 Time Series Forecasting
Marcus Carpenter, Chunbo Luo, Xiao-Si Wang

Privacy Preservation of COVID-19 Contact Tracing Data
Anifat Olawoyin, Carson Leung

BERT-BiLSTM-Caps Language Model for Screening of Children's Severe Mental Retardation
Qianhong Zhang, Wei Meng, Dujuan Liu, Huawei Tan, Simeng Ma, Mincheng Cai, Jun Yang, Zhongchun Liu

14:50-16:10 Session CIT-4: Networking Transmission and Multimedia Processing (Room-2)

Session Chair: Wang Miao, University of Exeter

Tuesday, 21 December 2021 | 14:50-16:10 (London Time)

Tuesday, 21 December 2021 | 22:50-00:10(+1) (Beijing Time)

Tuesday, 21 December 2021 | 09:50-11:10 (New York Time)

Trying an IP Over NDN Packet Gateway
Marielena Márquez-Barreiro, Miguel Rodríguez Pérez, Sergio Herrería-Alonso

Sensitivity-Aware Configurations for High Packet Generation Rate LoRa Networks
Hanan Alahmadi, Fatma Bouabdallah, Baraq Ghaleb, Ahmed Al-Dubai

Performance Evaluation of Probabilistic Broadcast in Low-Power and Lossy Networks
Djahida Ali-Fedila, Mohamed Ould-Khaoua

On Data Wastage When User Becomes Idle in HTTP Adaptive Streaming
Thai Duong Tran, Chanh Minh Tran, Hoang Hai Tran, Eiji Kamioka, Phan Xuan Tan

22 December 2021 Wendsday

08:30-10:10 Session DSCI-1: Social Network Analysis and Applications (Room-1)

Session Chair: Md Akbar Hossain, Manukau Institute of Technology

[Wendsday, 22 December 2021 | 08:30-10:10 \(London Time\)](#)

[Wendsday, 22 December 2021 | 16:30-18:10 \(Beijing Time\)](#)

[Wendsday, 22 December 2021 | 03:30-05:10 \(New York Time\)](#)

Dynamic Social Network Embedding Based on Triadic Closure Pattern Analysis

Min Yang, Xiaoliang Chen, Mingfeng Zhao, Yajun Du, Xianyong Li

A novel random walk strategy for network embedding using community aware and node influence biasing

Zhibin Wang, Xiaoliang Chen, Mingfeng Zhao, Xianyong Li, Yajun Du

Identifying influential nodes for blocking information cascades based on improved structural holes in social networks

Jing Han, Li Li, XiaoHua Zheng

A CPN-based information propagation model in Online Social Networks

Jinming Kong, Wangyang Yu, Fei Hao

An Overlap Community Propagation Algorithm based on Topics and Community Structure in Social networks

Hong-quan Bai, Lei-lei Shi, Lu Liu, John Panneerselvam, Zi-xuan Han

08:30-10:10 Session DSCI-2: Data Analytics and Mining (Room-2)

Session Chair: Yinxue Yi, Chongqing University of Posts and Telecommunications

[Wendsday, 22 December 2021 | 08:30-10:10 \(London Time\)](#)

[Wendsday, 22 December 2021 | 16:30-18:10 \(Beijing Time\)](#)

[Wendsday, 22 December 2021 | 03:30-05:10 \(New York Time\)](#)

An Effective Approach for Predicting P-value using High-dimensional SNPs data with Small Sample Size

Jiayu Wang, Fengtao Nan, Po Yang, Yun Yang, Jun Qi

Simulation-based Evaluation of the Reliability of Bayesian Hierarchical Models for sc-RNAseq Data

Sijia Li, Martín López-García, Luisa Cutillo

A New Interval Algebra for Temporal Data Modeling and Analysis

Kai Cheng, Sumao Sawada, Kesuke Abe

A Public Blockchain-based Identity Management Scheme and Petri Net-based Verification

Ji-qin Liu, Yan Wu, Lei-lei Shi, Zhi-yuan Li, Chen Liu

Sentiment Analysis of E-Commerce Reviews Based on Long Short-Term Memory Networks with Dropout Layer and Optimization

Zhenhui Chai, Jun Huang, Run Wang, Li Chen

10:20-12:00 Session DSCI-3: Artificial Intelligence and Machine Learning (Room-1)

Session Chair: Jiaying Shang, Chongqing University

[Wendsday, 22 December 2021 | 10:20-12:00 \(London Time\)](#)

[Wendsday, 22 December 2021 | 18:20-20:00 \(Beijing Time\)](#)

[Wendsday, 22 December 2021 | 05:20-07:00 \(New York Time\)](#)

Facial Expression Study Based on 3D Facial Emotion Recognition

HongYuan Cao, Chao Qi

A ensemble learning approach for predicting phenotypes from genotypes
Tingxi Yu, Wuping Zhang, Jiwan Han, Fuzhong Li, Zhihong Wang, Chunqing Cao

A Comparative Study of Machine Learning Algorithms to Predict Road Accident Severity
Shakil Ahmed, Md Akbar Hossain, Md Mafijul Islam Bhuiyan, Sayan Kumar Ray

Spatio-temporal Tensor Multi-Task Learning for Precision fertilization
Yu Zhang, Tong Liu, Yang Li, Ruijing Wang, He Huang, Po Yang

Performance Analysis of Distributed Deep Learning Frameworks in a Muti-GPU Environment
Tulasi kavarakuntla, Liangxiu Han, Huw Lloyd, Annabel Latham, Samson Akintoye

10:20-12:00 Session DSCI-4: Computational Intelligence and Cutting-edge Applications (I) (Room-2)

Session Chair: Fei Hao, University of Exeter

Wendsday, 22 December 2021 | 10:20-12:00 (London Time)

Wendsday, 22 December 2021 | 18:20-20:00 (Beijing Time)

Wendsday, 22 December 2021 | 05:20-07:00 (New York Time)

Nuclei Instance Segmentation and Classification in Histopathological Images using a DT-Yolact
Yuhang Jia, Cheng Lu, Xue Li, Miao Ma, Zhao Pei, Zemguo Sun, Yuli Chen

Agent's Feedback in Preference Elicitation
Tereza Siváková, Miroslav Kárný

Hanfu Online Social Network Design based on Personalized Recommendation Technology
Zehang Li, Peiqing Cao, Yushun Liu, Jianming Yang, Bowen Sun

Virtual Reality Immersive Interactive Design Based on Big Data Technology
Yang Wang

12:30-14:10 Session DSCI-5: Computational Intelligence and Cutting-edge Applications (II) (Room-1)

Session Chair: Yuli Chen, Shannxi Normal University

Wendsday, 22 December 2021 | 12:30-14:10 (London Time)

Wendsday, 22 December 2021 | 20:30-22:10 (Beijing Time)

Wendsday, 22 December 2021 | 07:30-09:10 (New York Time)

Sound Event Detection Based on Bidirectional Temporal Convolutional Network and Gated Recurrent Unit
Yihan Chen, Min Guo, Zhiqiang Li

Design and Application of Virtual Avatar Framework Based on E-commerce Live Streaming
Xinghong Fu, Qingsheng Li, Naye Ji

A Dynamic Collaborative Filtering Algorithm based on Convolutional Neural Networks and Multi-layer Perceptron
Qiang Sun, Lei-lei Shi, Lu Liu, Zi-xuan Han, Liang Jiang, Yao Lu, John Panneerselvam

MMPDNet: Multi-Stage & Multi-Attention Progressive Image Denoising
JiangBo Xue, Jiu Liang, Yu Zhang, Jinhe He, Yu Zhang, Yanda Hu

22 December 2021 Wendsday

12:30-14:10 Session SmartCNS-1: Smart Computing (Room-2)

Session Chair: Hao Chen, Nanjing University

[Wendsday, 22 December 2021 | 12:30-14:10 \(London Time\)](#)

[Wendsday, 22 December 2021 | 20:30-22:10 \(Beijing Time\)](#)

[Wendsday, 22 December 2021 | 07:30-09:10 \(New York Time\)](#)

Multi-Label Text Classification Based on Multidimensional Information Extraction
Bin Fan, Feng Zhu, DJ Ning, Junzhe Lu

Vehicle User Identification Model based on Telecom Big Data
Chen Zifan, Qingqing Zhan

Correlation Metric Selection based Correlation Alignment for Cross-project Defect Prediction
Jingwen Niu, Zhiqiang Li, Chao Qi

Adaptive Data Masking-based Named Entity Recognition
Yang Yunlu, Wang Miaoqiong, Guo Meiyong

Performance Analysis on Electric-Vehicle Charging in Low Temperature Environment
Zhaohui Wang, Baoqiang Zhang, Chuan Li, Lixue Chen

14:20-16:20 Session SmartCNS-2: Smart Networking (Room-1)

Session Chair: Qilin Fan, Chongqing University

[Wendsday, 22 December 2021 | 14:20-16:20 \(London Time\)](#)

[Wendsday, 22 December 2021 | 22:20-00:20\(+1\) \(Beijing Time\)](#)

[Wendsday, 22 December 2021 | 09:20-11:20 \(New York Time\)](#)

Performance Study of Improved BBR Congestion Control Algorithm using QUIC in Wireless LAN
Mengjie Zuo, Haoying Wu, Yi Han, Yi Zhong, Jiazheng Wang

OSS Data based Evaluation Algorithm for Radio Utilization Rate under 5G Massive MIMO
Yuchao Jin, Yi Li, Shengli Guo, Xinzhou Cheng, Fei Li, Deyi Li, Lexi Xu, Yuwei Jia, Lijuan Cao

Survey on 5G Network Expansion Methods
Yi Li, Yuchao Jin, Yuting Zheng, Xiaomeng Zhu, Xinzhou Cheng, Fei Li, Lexi Xu, Lijuan Cao

5G Residency Enhancement Method based on 5G Beam Intelligent Optimization
Tian Xiao, Kun Chao, Guanghai Liu, Yi Li, Guoping Xu, Lexi Xu, Chen Cheng, Yuchao Jin, Yuting Zheng

Performance Analysis of the IEEE 802.11p EDCA for Vehicular Networks in Imperfect Channels
Ning Wang, Jia Hu

Network Security Situation Assessment Methods and Tactics Based on Multivariate Spatiotemporal Attack Graph Model
Anshun Zhou

14:20-16:20 Session SmartCNS-3: Smart Services (Room-2)

Session Chair: Tong Li, Huawei

[Wendsday, 22 December 2021 | 14:20-16:20 \(London Time\)](#)

[Wendsday, 22 December 2021 | 22:20-00:20\(+1\) \(Beijing Time\)](#)

[Wendsday, 22 December 2021 | 09:20-11:20 \(New York Time\)](#)

A Novel Cost-sensitive Capsule Network for Audit Fraud Detection

Feng Zhu, DJ Ning, Yu Wang, Shipeng Liu

A Domain Model for SARS-COV-2 Rational Vaccine Design to Engineer a Prediction Tool for Binding Affinity and Antigenicity

Aritra Ghosh, Maria M. Larrondo-Petrie, Mirjana D. Pavlovic

Deep Learning-Based Fusion of Visible Light Positioning and IMU Sensors

Luchi Hua, Yuan Zhuang, Jun Yang

Design of Virtual Reality Education Platform based on 5G MEC

Zhen Guo, Pengzhou Zhang, Junjie Xia

Telecom Big Data based Precision Marketing Algorithms for Financial Industry

Xueyi Hao, Chen Cheng