



# 2019 International Conference on Cyber-Enabled Distributed Computing and Knowledge Discovery

(Name in Chinese: 第11届网络分布式计算与知识发现国际会议)

October 17-19, 2019

Guilin Lijiang Waterfall Hotel (桂林漓江大瀑布饭店)

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# Celebrating 11th CyberC

It is our greatest pleasure to welcome you to the 11th CyberC (International Conference on Cyber-enabled distributed computing and knowledge discovery). Thanks are expressed to your participations. CyberC is an international conference on cyber-enabled technology. This conference covers various R&D topics in the areas of cyber-networks, AI and machine learning, Blockchain and cyber security, wireless communications, and Internet of Things, and other cyber-related research. CyberC started in 2009 as a forum for presentation and discussion of innovative cyber-enabled technologies. CyberC 2019 is hosted by Guilin University of Electronic Technology (Organizer), Zhengzhou University, Nanjing University of Posts & Telecommunications, and the University of Louisville.

Thanks for the supports from the IEEE, IEEE Computer Society, IEEE Big Data, IEEE SDN, and IEEE Communications society on Big Data. We also sincerely express our appreciation to ZTE, Huawei, Guilin University of Electronic Technology, Nanjing University of Posts and Telecommunications, Zhengzhou University, and InfoBeyond. CyberC is impossible without these sponsorships and participations from these organizations.

Enjoy the conference!

Bin Xie and Liang Chang

**CyberC General Chairs**  
**September 30, 2019**

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- ◆ Please register yourself at the CyberC onsite to retrieve your conference material.
- ◆ Some events in conference schedule may be adjusted that may be caused by unexpected issues.
- ◆ Please join in our WeChat, QQ groups for urgent notification if we have.
- ◆ All papers **have to** be orally presented with PPT.
- ◆ Oral presentation time slots — minimal time: 15 minutes, and maximal time: 20 minutes.
- ◆ Each session will have a Session Chair. Extra time is permitted under the permission of the Session Chair.
- ◆ For your presentation, you can use your computer or the computer from Session Chair which runs in Window system.
- ◆ Please take care of your belongings all the time and enjoy the conference.
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# International Conference on Cyber-Enabled Distributed Computing and Knowledge Discovery

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## CyberC 2019 & Emerging Technology Summit Keynote Moderator

**Keynote 1: David Lu (陆惠晨), Vice President, SDN Platform & Systems Development, AT&T Labs, USA**



David Lu, Vice President, SDN Platform & Systems, is responsible for development and engineering of AT&T's next generation SDN (Software Defined Network) platform enabling AT&T network virtualization and OSS/operation process transformation which includes ECOMP platform and open source ECOMP (ONAP), API, micro-services, policy control & orchestration, hyper-automation, and advanced data analytics. David leads a multifaceted organization with more than 3,000 people across the globe.

David is a well-respected leader across multiple technology domains including: large scale, real time software architecture and development, network performance and traffic management, work flow and policy-controlled automation, large database and big data implementation (mining & analytics), machine learning, artificial intelligence, software reliability and quality, and network operations process engineering. David has led major software platform transformation initiatives from sales to network/service delivery/assurance, and billing platforms. Examples of David's achievements include large scale platforms he has both led and engineered that process annually: 984 Trillion Trillion network performance events and 348 Billion alarms with 99.99%+ automation; 60 Million dispatches with 14.4 Billion automated manual steps; and over 90 Billion API transactions.

Since joining AT&T Bell Labs in 1987, David has served in various leadership positions at AT&T. Over the past 15 years, David has led numerous automation initiatives that have resulted in multi-billion-dollar savings and in 2010 he received the CIO 100 Award for his efforts. David holds 45 patents and has frequently appeared as a guest speaker at technical and leadership seminars and conferences throughout the world. David has received numerous industry awards including the 2015 Chairman's Award from the IEEE Communication Society for Network and Systems Quality and Reliability; and the 2017 CIE AAEOY (Asian America Engineer of Year) Award. David is tremendously active in community organizations and activities including AT&T APCA, DFW-CIE, the DFW Asian American Chamber of Commerce, and was recognized by AT&T APCA in 2015 with the Corporate Leadership Award.

David was accepted to the world-renowned Shanghai Conservatory of Music and came to the U.S. to complete his college education; an undergraduate degree in Music (majoring in cello performance), and a graduate degree in Computer Science.

### **Topic: Supporting the growth in 5G era: AT&T's winning network combination**

**Abstract:** Network traffic is growing exponentially, driven by the insatiable hunger for data consumption and the introduction of new technologies like AR/VR, IoT and 5G. Supporting this growth necessitates a transition from a hardware-centric to a software-centric network that addresses tremendous architecture challenges of greater complexity, faster speeds and enhanced reliability. 5G promises to deliver business and consumer experiences never-before possible over previous generations of networks. Massive IoT. Network slicing. Seamless, untethered AR/VR. But these complex technologies will also push the limits of what our network can handle. Keeping up with the pace of rapid innovation and new services requires an intelligent, flexible, virtualized network. Hardware can't do that, but software can. AT&T will share how it is utilizing SDN, NFV and a DevOps approach to build a highly scalable and agile, transformative network delivering world-class results.

# CyberC 2019 & Emerging Technology Summit Keynotes

## Keynote 2: Chee Ching, President, FarEasTone, Taiwan



Dr. Chee Ching joined FarEasTone in Sep. 2018 as the Chief Transformation Officer and was appointed as the President since Jan. 2019. Her current priority is on the strategy implementation of “Fit, Transform and Grow”, building 5G, Big Data, AI & IoT capabilities, and accelerating FET’s transformation into digital services & advanced ICT Enterprise Solutions provider, beyond traditional telecom services. Chee brought to FarEasTone more than 23 years of rich experience in network operations and IT management in AT&T. Her professional background spans from Network Operations Planning, Systems Engineering, and Process Engineering to Delivering E2E System Solutions for AT&T’s products and services. Chee was awarded Outstanding 50 Asian Americans in Business in 2018 for her distinguished performance. Prior to joining Huawei, Dr. Peike was Lucent Bell-labs distributed member of technical staff (DMTS) and was accepted as alcatel-lucent technical academy member (ALTA) also, he has over 10 years new product development and software architecture solid experience on cloud/NFV solution, distributed DB, Intelligent Network Applications, Data Mining/Analysis.

### Topic: Telco’s Digital Transformation & 5G

**Abstract:** Global telecom market penetration is getting saturated. The industry is facing severe market competition and threats from Internet giants and other OTT players. FarEasTone, like the most of worldwide leading telco operators, is transforming from a traditional telecom operator to a digital service and enterprise solution provider to open up new economy opportunities. FarEasTone has adopt Big Data analytics , Artificial Intelligence, and Internet of Things (IoT) as core capabilities and competitive advantages. For instance, building up own IoT platform to capture new revenue streams and applying AI technology to fraud detection for revenue loss prevention. 5G as a revolutionary technology is enabling new applications like high quality entertainment services in consumer segment and vertical solutions in enterprise sector, which is becoming the new blue ocean for the telcos.

## Keynote 3: Junlan Feng, Chief Scientist at China Mobile Research, General Manager of AI and Intelligent Operation R&D Center



Dr. Feng has led R&D of China Mobile on artificial intelligence and big data since September 2013. She had been the architect of IBM Big Data from January 2013.1 to August 2013 and a principal researcher at AT&T Labs Research from August 2001 to January 2013. Dr. Feng received her Ph.D. on Speech Recognition in 2001 from Chinese Academy of Sciences. She is an IEEE senior member, an IEEE speech and language committee member and IEEE industry committee member. She is a reviewer for major data mining, speech, and natural language international conferences and journals. She has chaired and organized multiple conferences in these fields. Dr. Feng has over 70 professional publications and has been granted 42 U.S and international patents.

### Topic: When Telecom Network Meets Neural Network

**Abstract:** Network Intelligence lately has been a luring concept that network operators, vendors, and researchers all are passionate about. Deep neural network is the main stream architecture of the state-of-art artificial intelligence technologies across a number of disciplines such as image processing, speech recognition, natural language understanding, etc. What is the potential of a deep neural network for a telecom network? This talk overviews the recent industrial and academic efforts on this line of exploration and shares the challenges.

## CyberC 2019 & Emerging Technology Summit Keynotes

### Keynote 4: Professor Lin Dai, City University of Hong Kong, China



Dr. Lin Dai received the B.S. degree from Huazhong University of Science and Technology, Wuhan, China, and the M.S. and Ph.D. degrees from Tsinghua University, Beijing, China, all in electronic engineering. She is now a full professor of Department of Electronic Engineering of City University of Hong Kong. She has broad interests in communications and networking theory, with special interests in wireless communications. Her recent research work focuses on modeling, performance analysis and optimal access design of next-generation mobile communication systems. She was a co-recipient of the Best Paper Award at the IEEE Wireless Communications and Networking Conference (WCNC) 2007 and the IEEE Marconi Prize Paper Award (the annual Best Paper Award of IEEE Transactions on Wireless Communications) in 2009. She received The President's Award of City University of Hong Kong in 2017.

**Topic: Opt. Network Decomposition for Next-Generation Mobile Communication Systems**

#### Abstract

The fundamental idea of network decomposition is to break a large-scale network into smaller parts such that the subnetworks can operate in parallel, each with a much lower dimensionality. For large-scale wireless networks, the cellular structure is based on the idea of network decomposition, where the network is decomposed into multiple subnetworks, i.e., cells, according to the coverage of each base-station (BS). Such a decomposition scheme, nevertheless, leads to strong interference among subnetworks, which becomes increasingly significant as the density of BSs grows. For the next-generation cellular network where a massive amount of BSs need to be deployed to meet the ever-increasing demand of high data rate, it is of paramount importance to develop efficient network decomposition schemes to replace the current cellular structure. How to build such a decomposition framework, unfortunately, has remained largely unknown. In this talk, I will introduce our recently proposed network decomposition theory for large-scale wireless networks. Specifically, starting from a novel bipartite graph representation of an infrastructure-based wireless network, I will show that in general the optimal network decomposition can be formulated as a graph partitioning problem. I will then demonstrate how to solve it by the proposed Binary Search based Spectral Relaxation (BSSR) algorithm. The performance of the proposed BSSR algorithm is further examined and compared to the current cellular structure and BS clustering in various scenarios. Significant gains are shown to be achieved by the proposed BSSR algorithm, which corroborates that the optimal network decomposition of next-generation cellular networks should be performed based on a bipartite graph where the geographical information of BSs and users are both included.

### Keynote 5: Raimo Kantola, Professor of Networking Technology, Aalto University, Finland



Raimo Kantola has a D.Tech degree in computer science from Helsinki University of Technology, Finland. He is a professor in networking technology at department of Comnet, Aalto University, Finland. His research interests include SDN, customer edge switching, trust in networks and cloud security.

**Topic: Cooperative Security for 5G/6G and the Internet**

**Abstract:** The talk describes the idea of cooperative security for the Internet and 5G/6G. The idea of cooperative security is that all good guys would cooperate automatically to mitigate all hacking over the Internet sharing evidence of misbehaviour, constraining detected infected hosts and deploying security patches as quickly as they become available. The talk outlines the solution called Customer Edge Switching as an implementation of cooperative security. The talk discusses the architecture and describes briefly some use cases under real world constraints. The technical details can be found in [www.re2ee.org](http://www.re2ee.org) and naturally e.g. in IEEE Explore. The concepts presented in the talk have been proven by Proof of Concept or running code level experimental implementation published in [GitHub/Aalto5G](https://github.com/Aalto5G). We encourage its use in further experimentation. Our current work is targeted at optimizing the body of running code and learning from use cases in 5G vertical networks.

## CyberC 2019 & Emerging Technology Summit Keynotes

### Keynote 6: Anup Kumar, PhD, Professor, University of Louisville, Kentucky, USA



Anup Kumar (ak@louisville.edu) completed his Ph.D. from North Carolina State University and is currently a Professor of CECS Department at the University of Louisville. He is also the Director of Mobile Information Network and Distributed Systems (MINDS) Lab. His research interests include web services, wireless networks, distributed system modelling, and simulation. He has co-edited a book titled, "Handbook of Mobile Systems: Applications and Services" published by CRC press in 2012. He is an Associate Editor of IEEE Tran. on Services Computing. He is also the Associate Editor of Internal Journal of Web Services Research and Int. Society of Computers and Their Application Journal. He is a member of IEEE Distinguished Visitor Program (2006-2008). He was the Chair of IEEE Computer Society Technical committee on Simulation (2004-2007). He has published and presented over 150 papers. Some of his papers have appeared in ACM Multimedia Systems Journal, several IEEE Transactions, Wireless Comm. and Mobile Computing, Journal of Parallel and Distributed Computing, IEEE Journal on Selected Areas in Communications etc. He was the Associate Editor of Journal of Engineering Design and Automation 1995-1998. He has served on many conference program and organizing committees such as IEEE ISCC 2007, IEEE ICSW-2006, IEEE MASS-2005, IEEE SCC-2005, IEEE ICWS-2005, CIT-2005, IEEE MASCOTS, ADCOM 97 and 98. He has also edited special issues in IEEE Internet Magazine, and International Journal on Computers and Operations Research.

#### Topic: Building Secure Cloud Information System using Cloud Security Architecture Tool

**Abstract:** Today's commercial and government information systems include clouds, networks, data systems, and complex storage databases that contain sensitive personal information. Organizations must be entrusted with security and privacy risk management to ensure their information systems operate securely and reliably. In order to provide structured guidance and framework NIST has developed extensive guidelines and specifications to assist organizations. The NIST 800 Series is a set of documents that describe United States federal government computer security policies to implement and manage the system information security risk. For example, SP 800-200 is Cloud Computing Security Reference Architecture specification to accelerate the secure adoption of cloud computing. SP 800-53 R4 defines the security and privacy controls recommended for each functional capability or micro-service a system implements. One of the issues with these standards is how an organization can implement these specifications. To provide this capability, a tool Cloud Security Architecture Tool (CSAT) is developed that aims to leverage the Cybersecurity Framework (CSF) to identify the NIST SP 800-53 security and privacy controls for cloud-based information systems by identifying the necessary functional capabilities the system needs to provide to support the organization's mission and the service the system is designed for. In this talk, we will discuss the motivation and significance of NIST's specifications. In addition, it provides a discussion on the role of CSAT in an organization to enhance and facilitate adoption of secure cloud solution.

### Keynote 7: Khalil Drira, LAAS-CNRS, University of Toulouse, France



Khalil DRIRA received the Engineering and M.S. (DEA) degrees in Computer Science from ENSEEIHT (INP Toulouse, France), in 1988. He obtained the Ph.D. and HDR degrees in Computer Science from UPS, University Paul Sabatier Toulouse, France in 1992, and 2005 respectively. He joined CNRS, the French National Center for Scientific Research, in 1993 as a researcher. He is, since Oct 2010, Research Director, a full-time research position at CNRS. Khalil DRIRA's research interests include formal design, implementation, testing and provisioning of distributed communicating systems and cooperative networked services. He is or has been involved in several national and international projects in the field of distributed and concurrent communicating systems. He is author of more than 150 regular and invited papers in international conferences and journals. He is member of the editorial board of many international journals in the field of software architecture and communicating and distributed systems. Khalil DRIRA has been editor of a number of proceedings, books and journal special issues in these fields.

#### Topic: Semantic interoperability for IoT Platforms

**Abstract:** Recent advances in information and communication technologies include virtualization both at the processing and the communication levels as well as interoperability at the different interaction levels. The progress in networking encompasses Machine-to-Machine (M2M) communications for Internet of Things and Big Data traffic that constitute active research and standardization activities in Europe by ETSI, and around the world by OneM2M. The design and deployment of interoperable IoT platforms based on open systems and interfaces are identified as enablers for the digital market. The strategic application domains include e-health, connected and automated vehicles, advanced dynamic manufacturing, energy management and smart homes, buildings and cities. IoT Systems provide advantages in all these various domains. This fast-growing ecosystem is leading IoT towards a promising future. However, IoT systems expansion opportunities are not straightforward. A set of challenges should be overcome to enable IoT mass-scale deployment across various domains including interoperability, autonomy, and scalability issues. This talk aims at giving an overview of these challenges. Recent international standardization and R&D initiatives will be investigated. Future directions will be highlighted.

# CyberC 2019 & Emerging Technology Summit Keynotes

## Keynote 8: Prof. Chengnian Long, Shanghai JiaoTong University, Shanghai, China



Chengnian Long is a full professor of Department of Automation, School of Electronic Information and Electrical Engineering, Shanghai Jiao Tong University. His research interest mainly focuses on the Cyber-Physical Systems (CPS), including: 1) Cyber-Physical Systems (CPS) Security: security estimation and control of CPS, intrusion detection system, blockchain security; 2) Internet of Things (IoT): crowd sensing, fog computing, internet of vehicle, wireless MIMO system and 3) Distributed Intelligence Systems: embedded computer vision for smart devices (UAV, Autonomous vehicles), blockchain.

### Topic: Trusted Intelligent Internet of Things: Key Technologies and Application Cases

**Abstract:** This report introduces the use of blockchain technology to construct a trusted and distributed IoT system architecture to enhance IoT system security and data sharing, which can promote the application value for IoT in future digital economy. Key technologies include device autonomous identity and security authentication, distributed data storage and distribution, and distributed consensus protocol. We will introduce some application cases in intelligent transportation and smart medical care to explore the value of blockchain technology in the real economy.

gent transportation and smart medical care to explore the value of blockchain technology in the real economy.

First, many current critical infrastructures such as power grids, transportation systems, and medicine systems are emerging with the tight integration of physical processes and cyber world. Due to the crucial role of cyber-physical systems in everyday life, cyber-physical security needs to be promptly addressed. Particularly, his research group is focus on the security estimation and control of power grids and industrial control systems. Second, he has a long-term concern on the fundamental networking problem in Internet of Things, such as crowd sensing system, fog computing of intelligence gateway, MIMO wireless technology for smart devices. Particularly, his research group is focus on the sensing, computing, communication, and control integration of Internet of Vehicles (IoV). Third, the long-term view is to develop system intelligence for both CPS and IoT. An emerging trend is data-driven distributed intelligence system. Thus, the large-scale trust and reliable data is the power source for intelligence system. Furthermore, to apply the AI technology (deep learning and computer vision) from the laboratory to the real world that require a new approach to supporting the associated power, weight, space, and real-time constraints. Particularly, his research group is focus on investigating the blockchain technology to construct distributed intelligence system and developing the embedded computer vision and deep learning technology for UAV and autonomous vehicles.

## Keynote 9: Prof. Guangxia Xu, Chongqing University of Posts and Tele., Chongqing, China



Dr. Xu is currently Ph.D. adviser, vice director of Network and Information Security Engineering Center of Chongqing. She is a senior member of China Computer Federation (CCF); Blockchain Committee member; ACM and IEEE member; vice chairman of Information Security Association of Chongqing; expert of National Natural Science Foundation and committee member of Technical Committee on Fault Tolerant Computing of CCF. She has served as director of Big Data Security and Intelligence Analytics Technology Innovation Team in Chongqing. She was a visiting scholar at Stevens Institute of Technology, New Jersey, USA and a post-doctor at School of Communication and Information Engineering, Chongqing University. Prof. Xu 's research interests include Blockchain Technology and Application, Big Data Security and Analytics, Network Security and Management, IoT Security and AI Security. Extensive and novel results have been accomplished and most of them have already been published through high-quality journal, conference papers and projects. She is in charge of one sub-project of National Science and Technology Support Projects, two projects of National Natural Science Foundation of China, one sub-project of information Security Projects of National Development and Reform Commission, and more. In addition, she is a reviewer for ACM Computing Surveys, IEEE Access, Digital Communications and Network, International Journal of Geographical Information Science, and member of the editorial board of Journal of Chongqing University of Posts and Telecommunications.

### Topic: Blockchain Data Sharing and Its Industry Case Study

**Abstract:** The Due to the advanced features of openness, anonymity, immutability and decentralization of blockchain technology, it is currently a hot topic of interest to technology giants and business communities. Combining with big data, cloud computing and IoT, blockchain technology is a promising trend and is expected to ensure sharing data trustworthiness and security. Using the smart contract and distributed storage in blockchain to reduce costs, improve work efficiency and promote social development of the intelligent. This talk will introduce disadvantages of traditional centralized data and definite advantages brought by blockchain in data sharing. Furthermore, we will propose the application of blockchain data sharing in different industries in detail, such as agriculture, IoT, medical health and so on. Especially, framework design, smart contracts and consensus mechanisms give our own methods. At last, we will talk about the point that blockchain promotes coordinated social development and shared economy.

## CyberC 2019 & Emerging Technology Summit Keynotes

### Keynote 10: Rui Tan, School of Computer Science and Engineering, Nanyang Tech. University, Singapore



Dr. Rui Tan is an Assistant Professor at School of Computer Science and Engineering, Nanyang Technological University. Previously, he was a Senior Research Scientist at Advanced Digital Sciences Center, a Singapore-based research center of University of Illinois at Urbana-Champaign, and a postdoctoral Research Associate at Michigan State University. He received PhD degree from City University of Hong Kong. His research interests include sensor networks, Internet of things, and cyber-physical systems. He is the recipients of IPSN'17 and CPSR-SG'17 Best Paper Awards, IPSN'14 and PerCom'13 Best Paper Award Runner-Ups, and CityU Outstanding Academic Performance Award. He is a Senior Member of the IEEE.

#### Topic: Cyber-Physical Approach to Resilient City-Scale IoT Systems

**Abstract:** With the increasing connectivity and intelligence of massive objects, various city-scale systems such as utility infrastructures and transportation systems are evolving into their next generations for higher efficiency. However, they also face growing risks such as unexpected disturbances and even malicious attacks. Therefore, in the pursuit of the smart city vision, it is also important to enhance the resilience of these systems upon the contingency of these risks. In this talk, I will present our recent research on leveraging a city-scale physical process, i.e., the delivery of alternating current electricity, to achieve resilient timestamping and clock synchronization for Internet-of-Things objects found in electrified systems, smart ambient, and even on human bodies.

### Keynote 11: Meiqin Wang, Professor of Shandong University, China



Meiqin Wang takes charge of Executive Vice-President of School of Cyber Science and Technology, Shandong University and Vice-Director of Key Laboratory of Cryptologic Technology and Information Security, Ministry of Education, Shandong University. Supported by the 973 Program, National Natural Science Foundation of China, and Chinese Major Program of National Cryptography Development Foundation, she mainly studies cryptanalysis and design methods of the symmetric cipher. In recent years, she has published more than 60 papers in top conferences and journals of cryptography, including 13 papers in the top 5 international conferences. She was invited to give talks on many international seminars of cryptography, such as the Dagstuhl Seminar on Symmetric Cryptography, Early Symmetric Cryptography (ESC), and Asian-workshop on Symmetric Key Cryptography (ASK). She is a member of a council for the Chinese Association for Cryptologic Research. As a co-chair, she held

the third Asian-workshop on Symmetric Key Cryptography. She undertook the program chairs of several top 5 international conferences in the field of cryptography, such as ASIACRYPT and FSE.

#### Topic: Novel Cryptanalysis and Design of Symmetric Ciphers

**Abstract:** As the cornerstone to assure cybersecurity, the cipher plays a critical role in the security authentication and encipherment protection. With the advantage of high efficiency, the symmetric-key encryption scheme has a broader and more flexible application comparing to the public-key encryption scheme. This report is centred on the design and cryptanalysis of symmetric ciphers. On the aspect of automatic cryptanalysis, we manage to depict the problems in cryptography from the view of operational research and algebraic theory. A series of automatic models regarding different kinds of attack methods are constructed, which become valuable universal analytical tools in the international cryptology field. These new models are integrated into the platform of automatic cryptanalysis, which can efficiently accomplish the tasks in cryptanalysis and plays a crucial part in the design of innovative ciphers. The design and cryptanalysis of ciphers are two complementary sides and bring out the best in each other. Thus, the update of cryptanalytical methods also promotes the development of design techniques. We transform powerful analytical methods into ingenious design techniques and design several novel symmetric ciphers.

## CyberC 2019 & Emerging Technology Summit Keynotes

### Keynote 12: Dr. Li Tian, Research Manager, Department of Wireless Algorithm, ZTE Corporation, China

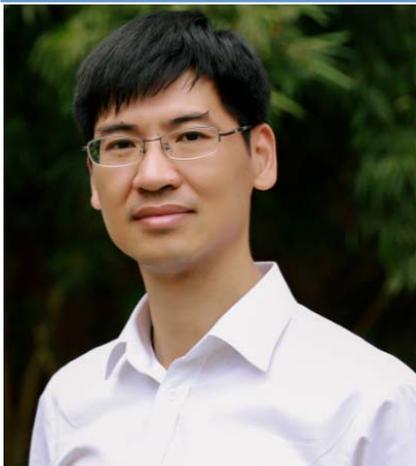


Dr. Li Tian is currently a research manager at the department of the wireless algorithm of ZTE corporation. He received his bachelor degree in Communication Engineering and the Ph.D. degree in Control Science and Control Engineering from Tongji University, Shanghai, China. He was a visiting Ph.D. student at the Department of Electronics and Information Systems (DEIS) of University of Bologna from 2013 to 2014. His current research interests are in the field of 5G new radio access technology, with over 40 scientific papers, 200 standard contributions, and 30 globally filed patents. He is a 3GPP RAN delegate and serve as rapporteur of Rel.16 Two-step RACH WI.

**Topic:** Ubiquitous Network - From Terrestrial To Aerospace

**Abstract:** The Phase 1 5G NR standardization (Rel.15) has been frozen in 3GPP by March 2019, which mainly focused on the traditional eMBB services. In later releases, the standardization society envisions more vertical applications from the scoping of the work items, such as V2X, NR-U, Industrial IoT, NR-light, NTN, AR/VR, home-IoT. The 5G-beyond or 6G vision is aimed to provide a ubiquitous and robust network, where mobile terminals could be anywhere and access the network at any time. This cannot be fulfilled solely based on the traditional cellular networks, but also rely on the non-terrestrial operators such as satellite and HAPS (e.g., drones or hot-air balloon). This talk briefly introduces the latest standardization activities in 3GPP, and focus more on the use case and technical challenges of non-terrestrial networks.

### Keynote 13: Gansen Zhao, South China Normal University, China



Dr. Gansen Zhao received his Ph.D from the University of Kent, UK. He had worked for Oracle UK before his academic career. After serving for 2 years for Sun Yat-sen University, Dr. Zhao has been serving as a full professor in School of Computer Science, South China Normal University, China. He is now the deputy dean of School and is leading the Key Lab on Cloud Security and Assessment Technology of Guangzhou. His main research interests include Cloud Security, Trust Management, and BlockChains. He has published extensively in the above areas, and serves as program chairs for a number of conferences.

**Topic:** On the Security of Smart Contract

**Abstract:** Smart Contracts are driving Blockchain Application into a much wider area. It embeds business logic into Blockchain systems as automatic execution of computer programs. The execution is imperative and is immune to external intervention. While the mechanism is to implement trusted online compromise on Blockchain, the design and execution of smart contract ode are still subject to various risks. Investigation of the security of smart contracts, both before deployment and after deployment, are extremely important. This talk shares the exploration on the security of smart contracts before deployment. The exploration takes on the perspective of security testing and exploit testing techniques to understand the potential security risks of smart contracts.

## CyberC 2019 & Emerging Technology Summit Keynotes

### Keynote 14: Yang Yang, Shanghai Tech University, Shanghai, China



Dr. Yang Yang is currently a full professor with School of Information Science and Technology, ShanghaiTech University, China. Prior to that, he has held faculty positions at The Chinese University of Hong Kong, Brunel University (UK), University College London (UCL, UK), and SIMIT, Chinese Academy of Sciences (CAS, China). Yang is a member of the Chief Technical Committee of the National Science and Technology Major Project "New Generation Mobile Wireless Broadband Communication Networks" (2008-2020), which is funded by the Ministry of Industry and Information Technology (MIIT) of China. In addition, he is on the Chief Technical Committee for the National 863 Hi-Tech R&D Program "5G System R&D Major Projects", which is funded by the Ministry of Science and Technology (MOST) of China. Yang is a General Co-Chair of IEEE DSP 2018 conference and a TPC Vice-Chair of IEEE ICC 2019 conference.

Yang's current research interests include wireless sensor networks, Internet of Things, Fog computing, Open 5G, and advanced wireless testbeds. He has published more than 200 papers and filed over 80 technical patents in wireless communications. He is a Fellow of the IEEE.

#### Topic: AI-enabled Wireless Communication Networks

**Abstract:** In order to meet the ever-growing requirements of future intelligent applications and services, more and more computing resources and distributed AI algorithms have been deployed in wireless communication networks, thus achieving massive data processing and real-time decision making at local or regional sites. In this talk, we will first introduce the architecture, advantages and future trends of multi-tier computing networks, including the differences and collaborations between cloud, fog, and edge computing technologies. Further, a series of novel AI algorithms and solutions are developed to utilize local and regional computing resources for wireless channel modelling, capacity and coverage optimization, and indoor localization and tracking applications. Our research and experiments reveals the potentials of AI algorithms for wireless communication networks, as well as some new bottlenecks and challenges for future investigation.

## CyberC 2019 & Emerging Technology Summit Organizers

### Chi-Ming Chen (陳啟明) - Advisor, Ph.D. , AT&T Labs, USA



**Chi-Ming Chen** joined AT&T in 1995. He is with the AT&T Labs architecture organization which designs the Enhanced Control Orchestration Management Platform (ECOMP) and Open Network Automation Platform (ONAP). Prior to joining AT&T, Chi-Ming was with the Quality Assurance Center of Bell Communications Research (Bellcore) from 1985 to 1995 and was a faculty member at Tsing Hua University, Hsinchu, Taiwan from 1975 to 1979. He received his Ph.D. in Computer and Information Science from the University of Pennsylvania in 1985; M.S. in Computer Science from the Pennsylvania State University in 1981; M.S. and B.S. in Physics from Tsing Hua University, Taiwan, in 1973 and 1971 respectively.

Chi-Ming Chen is a Life Senior Member of IEEE and Senior Member of the ACM. He is an Advisory Board Member of IEEE Communications Society (ComSoc) Technical Committee on Communications Quality & Reliability (CQR). He was a member of the IEEE GLOBECOM & ICC Management & Strategy (GIMS) Standing Committee and served as the GLOBECOM and ICC Site Selection Chair from 2012 to 2017. He has chaired the Industry Forums of several GLOBECOMs and ICCs and is serving as the GIMS Advisor for ICC 2019, Shanghai, China.

From 2015 to 2017, Chi-Ming was a Steering Committee member of the IEEE SDN Initiative and IEEE Big Data Initiative. Currently, he is co-chairing the 5G Roadmap Working Group of IEEE 5G Initiative. He has been a key Organizing Committee member of CyberC conference since it's started in 2009. In addition, he also organizes the annual IEEE Emerging Technology Reliability Roundtable (ETR-RT) since 2014.

## CyberC 2019 & Emerging Technology Summit Organizers

### **Dr. Chonggang Wang, Interdigital Inc.**



Chonggang Wang received his Ph.D. degree from Beijing University of Posts and Telecommunications (BUPT) in 2002. He is currently a Member Technical Staff with InterDigital Communications. His current research interests include decentralized IoT, semantic computing and services for IoT, fog computing for IoT, IoT data analytics, and advanced IoT services. He also has abundant IoT standardization experience including oneM2M, IETF, IEEE, and ETSI TC M2M. He was the co-founder (2011-2013) and the founding Editor-in-Chief (EiC) of IEEE Internet of Things Journal (2014-2016). He is currently the Associate EiC of IEEE Transactions on Big Data and the EiC of IEEE Blockchain NewsLetter. He is an IEEE Fellow for his contributions to IoT enabling technologies (2017).

### **Tzyh-Jong (TJ) Wang, PhD, AT&T, USA**



Dr. TJ Wang is currently with AT&T since 2008. He is a system engineer for mobility operations support systems focusing on mobility network end-to-end performance and reliability. Prior to joining AT&T, TJ was with DEC, Bellcore, Lucent Technologies and UTStarcom between 1987 and 2008.

He received his Ph.D. in Industrial Engineering from the University of Wisconsin-Madison in 1987; and B.S. in Industrial Engineering from Tsing Hua University, Taiwan, in 1978.

### **Liang Chang, Dean of the School of Computer Science and Information Security, Guilin University of Electronic Technology, China.**



**Liang Chang** received his Ph.D. degree in computer science from the Institute of Computing Technology, Chinese Academy of Sciences, in 2008. He is currently a professor in the School of Computer Science and Information Security, Guilin University of Electronic Technology, China. His research interests include data and knowledge engineering, formal methods, and trusted software.

## CyberC 2019 & Emerging Technology Summit Organizers

### Yong Ding, Professor, Guilin University of Electronic Technology, China.



Prof. Yong Ding received his PhD in Cryptography from the School of Communication Engineering, Xidian University, China, in 2005. He is currently a Professor at School of Computer Science and Information Security, Guilin University of Electronic Technology, China, and an adjunct professor at the Cyberspace Security Research Center, Peng Cheng Laboratory, China. He was a research fellow of Computer Science at City University of Hong Kong from April, 2008 to September, 2009. His research interests include cryptography and information security.

### Bin Xie, CEO, InfoBeyond Technology LLC, USA



Dr. Bin Xie is the founder of the InfoBeyond. He received his M.Sc. and Ph.D. degrees in Computer Science and Computer Engineering from the University of Louisville, Kentucky, USA, 2003 and 2006 respectively. He is the co-editor/author of books titled *Handbook/Encyclopedia of Ad Hoc and Ubiquitous Computing* (World Scientific: ISBN-10: 981283348X, World Scientific Publisher) (Best Selling in 2012 & 2013), *Handbook of Applications and Services for Mobile Systems* (Auerbach Publication, Taylor and Francis Group, ISBN: 9781439801529, 2012) and *Heterogeneous Wireless Networks- Networking Protocol to Security*, (VDM Publishing House: ISBN: 3836419270, 2007).

Dr. Xie has published 70+ papers in the IEEE conferences and journals. His research interests are focused on, cyber security, big data, machine learning, and wireless communications. In particular, he has performed research works on the fundamental aspects of ABAC & Security Policy, Multilevel Security, Authentications, Security Monitoring and Network Security, Cloud Computing and HPC, Data Security, Distributed Network Storage, Satellite Networks, Wireless Sensor networks, Collaborative Machine Learning and Streaming (e.g., Graph Streaming), and Deep Learning. He has successfully established several mathematical models (e.g., graph theory, information/code theory, linear programming, and optimization) for communication networks and their security. He developed algorithms and protocols for high-capacity networks, tactical networking, data analysis, big data streaming.

Dr. Xie's research works have received 20+ awards, such as from the U.S. Navy and Naval Research Laboratory, U.S. Air Force and Air Force Research Laboratory, U.S. Army and CERDEC, Department of Energy - Office of Science, Department of Transportation, NIST (National Institute of Standards and Technology), Department of Commerce, Missile Defense Agency, Marine Corps, Kentucky Cabinet for Economic Development, and Kentucky Office of Commercialization and Innovation. Some of the research technologies are transferred to the governments and the commercial domains. Some other achievements include: (i) Fast growth IT-tech small businesses featured by The Silicon Review in 2017, (ii) Successful SBIR Story in 2018 for R&D of Security Policy Tool by NIST, (iii) Business Leader in Advancing the Network and Data Security Industry by Insight Success Magazine, (iv) Most Promising Storage Solution Providers by CIOReview Magazine in 2019.

Dr. Xie severed for NIH Special Emphasis Panel on System Science and Health in the Behavioral and Social Sciences, ZRG1 HDM-Q (50), 2012-2017. He is an editor member of the Journal of International Journal of Information Technology, Communications, and Convergence (IJITCC). He was the Guest Edit Chair of Elsevier Future Generation Computer Systems (FGCS) in a special issue on Mobile Computing, 2012.

# International Conference on Cyber-Enabled Distributed Computing and Knowledge Discovery

**Registration 注册: 16:00— 18:00 —October 16 or October 17 Morning and Afternoon  
(Location: Hotel Lobby)**

## Program Schedule

**CyberC 2019 Welcome Party: 19:00-21:00 PM, October 16, 2019 (三楼西餐厅—3F Western Restaurant)**

| CyberC 2019 Keynotes (3F Galaxy Hall—三楼银河厅), October 17, 2019 |   |   |
|---|---|---|
| Time  | Speaker   | Topics  |
| 8:00 – 8:30   | Dr. Bin Xie and Prof. Anup Kumar  | Conference Opening Ceremony, Message from Guilin University of Electronic Technology, and Logistics |
| 8:30 – 9:10   | David Lu 陆惠晨, VP, SDN Platform & Systems Development, AT&T Labs, USA                              | Supporting the growth in 5G era: AT&T's winning network combination                                 |
| 9:10 – 9:50   | Chee Ching, Far EasTone Winning Network Telecom Ltd, Taiwan                                       | Telco's Digital Transformation & 5G   |
| 9:50 – 10:00  | Tea break (Drink and cookie available)  |   |
| 10:00 – 10:40   | Junlan Feng, China Mobile, China  | When Telecom Network Meets Neural Network   |
| 10:40 – 11:20   | Lin Dai, City University of Hong Kong, China  | Optimal Network Decomposition for Next-Generation Mobile Communication Systems                      |
| 11:20 - 12:00   | Kantola Raimo, Aalto University,  | Cooperative Security for 5G/6G and the Internet   |
| 12:00 – 13:00   | Lunch Buffet 自助餐 (三楼西餐厅—3F Western Restaurant)  |   |
| 13:30 – 14:10   | Anup Kumar, University of Louisville, USA   | Building Secure Cloud Information System using Cloud Security Architecture Tool                     |
| 14:10 – 14:50   | Khalil Drira, University Toulouse, France   | Semantic Interoperability for IoT Platforms   |
| 14:50 – 15:20   | Tea break (Drink and cookie available)  |   |
| 15:20 – 16:00   | Chengnian Long, Shanghai JiaoTong University, China   | Trusted Intelligent IoT: Key Technologies and Application Cases                                     |
| 16:00 – 16:40   | Guangxia Xu, Chongqing University of Posts and Telecommunications, Chin                           | Blockchain Data Sharing and Its Industry Case Study   |
| 16:40 – 17:20   | Panel Discussions: Hosted by David Lu 陆惠晨, VP, SDN Platform & Systems Development, AT&T Labs, USA |   |
| 17:20 – 18:00   | Networking and Dialog with Speakers   |   |
| 18:30 – 20:00   | Dinner Buffet 自助餐 (三楼西餐厅—3F Western Restaurant)   |   |

# International Conference on Cyber-Enabled Distributed Computing and Knowledge Discovery

**CyberC & Emerging Technology Summit Date and Location: October 18, 2019**

## Keynote (1F Guixui Hall —一楼桂水阁)

|               |  |  |   |   |   |
|---------------|--|--|---|---|---|
| 8:00 – 8:20   | Prof. Yong Ding and Dr. Bin Xie                          |  | Exploration of Guilin, Conference Logistic Announcement     |   |   |
| 8:20 – 9:00   | Rui Tan, Nanyang Technological University, Singapore     |  | Cyber-Physical Approach to Resilient City-Scale IoT Systems |   |   |
| 9:00 – 9:40   | Meiqing Wang, Shandong University, China                 |  | Novel Cryptanalysis and Design of Symmetric Ciphers         |   |   |
| 9:40 – 10:00  | Tea break (Drink and cookie available)                   |  |   |   |   |
| 10:00—10:40   | Li Tian, ZTE, China                                      |  | Ubiquitous Network - From Terrestrial To Aerospace          |   |   |
| 10:40 – 11:20 | Gansen Zhao, South China Normal University, China        |  | On the Security of Smart Contract                           |   |   |
| 11:20– 12:00  | Yang Yang, ShanghaiTech University, China                |  | AI-Enabled Wireless Communication Networks                  |   |   |
| 12:00 – 13:00 | Lunch Buffet 自助餐 (三楼西餐厅—3F Western Restaurant )          |  |   |   |   |
|               | Conference Room 1<br>(一楼桂水阁 - 1F<br>Guixui Hall)         | Conference Room 2<br>(十二楼独秀厅) -<br>12F Duxiu Hall) | Conference Room 3<br>(十二楼叠彩厅 -<br>12F Diecai Hall)          | Conference Room 4<br>(二楼象山厅 - 2F<br>Xiangshan Hall) | Conference Room 5<br>(十五楼总统会见室 - 15F Presidential Meeting Room) |
| 13:00 — 15:40 | Session 1: Blockchain Design and Applications            | Session 3: Image and Video Processing              | Session 5: Blockchain Protocols                             | Session 7: 5G and Wireless Communications           | Session 9: Optimization Theory and Applications                 |
| 15:40 – 15:50 | Break  |  |   |   |   |
| 15:50 – 18:30 | Session 2: Security                                      | Session 4: Big Data and Machine Learning           | Session 6: Machine Learning and Analytics                   | Session 8: Robot IOT Smart Sensor Networks          | Session 10: Big Data, Analytics, Quality and Performance        |
| 19:00 –21:00  | Banquet (Best Paper Announcement) - 二楼咖啡厅 (2F—Café Hall) |  |   |   |   |

October 20, 2019 (TPC internal meeting) — No Public Conference Schedule —enjoying your personal time

# International Conference on Cyber-Enabled Distributed Computing and Knowledge Discovery

## Session 1: Blockchain Design and Applications

**Session Chair: Dr. Chonggang Wang, InterDigital, USA**

Conference Room 1 (一楼桂水阁 - 1F Guixui Hall), 13:00 — 15:40 October 18

| Authors (包括演讲人)   | Paper Titles (报告主题)   |
|---|---|
| Chunhua Deng; Jia Fan; Zhen Wang; Yili Luo; Yue Zheng; Yixin Li; Jianwei Ding   | A Survey on Range Proof And Its Applications on Blockchain                |
| Yili Luo; Jia Fa; Zhen Wang; Chunhua Deng; Yixin Li; Yue Zheng; Jianwei Ding    | Accountable Data Sharing Scheme Based on Blockchain and SGX               |
| Yixin Li; Zhen Wang; Jia Fan; Yue Zheng; Yili Luo; Chunhua Deng; Jianwei Ding   | An Extensible Consensus Algorithm Based on PBFT                           |
| Xiaowei He; Yiju Cui; Yunchao Jiang   | An Improved Gossip Algorithm Based on Semi-Distributed Blockchain Network |
| Fernando Vidal; Feliz Gouveia; Christophe Soares                                | Analysis of Blockchain Technology for Higher Education                    |
| Xinming Wang; Zhijian Xie; Jiahao He; Gansen Zhao; Ruihua Nie                   | Basis Path Coverage Criteria for Smart Contract Application Testing       |
| Yue Zheng; Yarong Li; Zhen Wang; Chunhua Deng; Yili Luo; Yixin Li; Jianwei Ding | Blockchain-based Privacy Protection Unified Identity Authentication       |
| Ismael Martinez; Sreya Francis; Abdelhakim Senhaji Hafid                        | Record and Reward Federated Learning Contributions with Blockchain        |

## Session 2: Security

**Session Chair: Professor Xiaolong Xu, Nanjing University of Posts and Telecommunications, China**

Conference Room 1 (一楼桂水阁 - 1F Guixui Hall), 15:50 – 18:30, October 18

| Authors (包括演讲人)  | Paper Titles (报告主题)   |
|--|---|
| Qingsheng Hu; Xiangning Fan; Qiaowei Zhang                           | An Effective Differential Power Attack Method for Advanced Encryption Standard                                    |
| Tangda Yu; FuTai Zou; Linsen Li; Ping Yi                             | An Encrypted Malicious Traffic Detection System Based On Neural Network   |
| Lin Li; Linfeng Wei  | Automatic XSS Detection and Automatic Anti-anti-virus Payload Generation  |
| Weifeng Lu; Mingji Wang; Jia Xu; Siguang Chen; Lijun Yang; Jian Xu   | Distributed Node Selection Algorithm for Physical Layer Security in D2D Network                                   |
| Sonali Chandel; Sun Yu; Tang Yitian; Zhou Zhili; Huang Yusheng       | Endpoint Protection: Measuring the effectiveness of remediation technologies and methodologies for insider threat |
| Shuaipeng Zhang; Hong Liu  | Environment Aware Privacy-Preserving Authentication with Predictability for Medical Edge Computing                |
| Mingxin MA; Xiaotong YANG; Guozhen SHI; Fenghua LI                   | Hierarchical Key Management Scheme with Multilevel Secure Access  |
| Yuxiang Chen; Guishan Dong; Jian Bai; Yao Hao; Feng Li; Haiyang Peng | Trust Enhancement Scheme for Cross Domain Authentication of PKI system  |
| Sonali Chandel; Zang Jingji; Yu Yunnan; Sun Jingyao; Zhang Zhipeng   | The Golden Shield Project of China: A Decade Later An in-depth study of the Great Firewall                        |
| Mingyuan xia; Lingyuan yin   | A Generic Construction of Puncturable Encryption  |

# International Conference on Cyber-Enabled Distributed Computing and Knowledge Discovery

## Session 3: Image and Video Processing

Session Chair: Anup Kumar, University of Louisville, USA

Conference Room 2 (十二楼独秀厅) - 12F Duxiu Hall), 13:00 — 15:40 October 18

| Authors (包括演讲人)                                  | Paper Titles (报告主题)  |
|--|--|
| Wenwen Chen; Zhibin Zhang; Hui Li; Shuai-min Hou | A New Method for Error Analysis of Binocular Stereo Vision System                          |
| Wenkao Yang; Xiangwei Zhai                       | Contrast Limited Adaptive Histogram Equalization for an Advanced Stereo Visual SLAM System |
| Yongfu Zhou; Zhi Zeng                            | Info-Retrieval with relevance feedback using Hybrid learning scheme for RS image           |
| Lanfei Wang; Jun Guo                             | Cascaded Algorithm Representation for Purifying Face Dataset with Labeled Noise            |
| Yu Liu; Chunling Cheng; Yulong Li; Lei Wang      | Network Coding for Reliable Video Distribution in Device-to-Device Communications          |

## Session 4: Big Data and Machine Learning

Session Chair: Anup Kumar, University of Louisville, USA

Conference Room 2 (十二楼独秀厅) - 12F Duxiu Hall), 15:50 – 18:30, October 18

| Authors (包括演讲人)  | Paper Titles (报告主题)  |
|--|--|
| Yaohui Jia; Feng Chen; Peng Wu; Qiang Liu; Yamin Chen; Yun Liu                     | A Study of Online Function Approximation System Based on BP Neural Network           |
| Jiangpeng Lin; Yu Wu; Li Wang; Weidong Ai; Yan Zeng                                | A User Influence Rank Algorithm Based on Interaction Behaviors in Cyber Group Events |
| Dongjie Zhu; Yundong Sun; Ning Cao; Xueming Qiao; Ming Xu; Jinlin Li; Junzhou Yang | BDNE:A method of Bi-directional Distance Network Embedding                           |
| Changpeng Zou; Chenggong Ni; Qing Lin; Kaiqiang Feng; Yuxi Wang                    | Face recognition in complex lighting environment                                     |
| XIA LIU; Yi-nan Chen; Zhao Qiu; Ming-rui Chen                                      | Forecast of the Tourist Volume of Sanya City by XGBoost Model and GM Model           |
| Shuai Jiang; Xiaolong Xu   | Impact of feature selection methods on data classification for IDS                   |
| Wenxin Wang; Ruilin Zhang  | Mixed attribute clustering algorithm based on filtering mechanism                    |

# International Conference on Cyber-Enabled Distributed Computing and Knowledge Discovery

## Session 5: Blockchain Protocols

**Session Chair – Professor Yong Ding - Guilin University of Electronic Technology, China**

Conference Room 3 (十二楼叠彩厅-12F Diecai Hall), 13:00 — 15:40 October 18

| Authors (包括演讲人)   | Paper Titles (报告主题)  |
|---|--|
| Haiyong Wang; Kaixuan Guo   | Byzantine Fault Tolerant Algorithm based on Vote                                       |
| Kirsten Cremona; Donald Tabone; Clifford De Raffaele                                      | Cybersecurity and the blockchain: Preventing the insertion of child pornography images |
| Lin Zhong; Xihua Duan; Yujue Wang; Jingyan Chen; Jidong Liu; Xiaoguang Wang               | eRoc: a Distributed Blockchain System with Fast Consensus                              |
| Bin Cao; Shouming Huang; Daquan Feng; Lei Zhang; Shengli Zhang; Mugen Peng                | Impact of Network Load on Direct Acyclic Graph Based Blockchain for Internet of Things |
| Haihui Huang; Jing Cai; Shaoci Xie  | Implementing an Asset Trading System Based on Blockchain and Game Theory               |
| Xuefeng Liu; Gansen Zhao; Xinming Wang; Yixing Lin; Ziheng Zhou; Hua Tang; Bingchuan Chen | MDP-Based Quantitative Framework for Proof of Authority                                |
| Guoliang Qiu; Qiwen Zheng; Xing Hu  | Multi-Terminal Collaborative Control Decision-Making Mechanism Based on Blockchain     |

## Session 6: Machine Learning and Analytics

**Session Chair – Professor Xiaolan Xie - Guilin University of Technology, China**

Conference Room 3 (十二楼叠彩厅-12F Diecai Hall), 15:50 – 18:30, October 18

| Authors (包括演讲人)  | Paper Titles (报告主题)   |
|--|---|
| Bo Jiao  | A Method for Extracting Topological Features of Internet Testbeds Oriented to Equivalent Deduction                  |
| Congyu Shi; Gaoyuan Zhang; Congzheng Han; Baofeng Ji; Ping Xie | A Non-coherent Detection Scheme of O-QPSK Receiver for Perfect-communication Establishment in Blockchain Technology |
| Lulu Sun; Ruilin Zhang   | Density clustering algorithm based on the dynamic selection of cluster center                                       |
| Hua Cheng; Yiquan Fang; Lihuang Chen; Jing Cai                 | Detecting Domain Generation Algorithms Based on Reinforcement Learning  |
| Yingjuan Tao; Jinsheng Deng; Xingshen Song                     | Drug Audit Based on Bisecting K-means Clustering Algorithm  |
| Panpan Cui; Quansheng Dou                                      | Slot Filling Using En-training  |
| Chuang Ma; Yanming Liang; Xiaofei Lyu                          | Weather Analysis to Predict Rice Pest Using Neural Network and D-S Evidential Theory                                |
| Xiaolan Xie, Zhihong Guo                                       | A CNN Approach of Activity Recognition via Channel State Information (CSI)  |

# International Conference on Cyber-Enabled Distributed Computing and Knowledge Discovery

## Session 7: 5G and Wireless Communications

Session Chair– TJ, Wang, AT&T

Conference Room 4 (二楼象山厅 - 2F Xiangshan Hall), 13:00 — 15:40 October 18

| Authors (包括演讲人)  | Paper Titles ( 报告主题 )   |
|--|---|
| Shuai xiaoying   | A Greedy Approach for TDMA based on Matrix Operation  |
| Jun Zou; Chen Xu   | High Precision Timing Based on Parabola Curve Fitting in Narrow-band System   |
| Shun-Ping Chen   | Near Field Beam Forming Characteristics of Conformal Antenna Arrays   |
| Chen Xie; Xiaokai Zhang; Daoxing Guo                           | Oblique Projection Polarization Filter-based Self-interference Cancellation Scheme in In-Band Full-duplex Systems         |
| Chunfeng Wang; Naijin Liu                                      | Research on synchronous wireless information and power transmission Based on OFDM for Space system                        |
| Guangzhi Li; Xiang Liu; Zonghuan Wu; Kaiyu Zhang               | The Future of Broadband Access Network Architecture and Intelligent Operations  |
| Nannan Wang; Dalong Zhang; Gangtao Han; Jiayao Chen            | A Dynamic Weighting Fusion Positioning Method Based on Opportunity Correction for INS and UWB                             |
| Pengxue Liu; Dalong Zhang; Yitong Li; Shijie Shi; Cuiping Kong | A Reliable Broadcast Algorithm with Multiple-Opportunity Acknowledgement in Internet of Vehicles                          |
| Ghulam Yasin, Syed Fakhar Abbas, Waseem Iqbal                  | Performance Evaluation of heterogeneous network via IEEE802.11.X and LTE Multi-homing framework in VANETs using Estinet 8 |

## Session 8: Robot, IOT, Smart Sensor Networks

Session Chairs – Liang Chang - Guilin University of Electronic Technology, China

Conference Room 4 (二楼象山厅 - 2F Xiangshan Hall), 15:50 – 18:30, October 18

| Authors (包括演讲人)   | Paper Titles ( 报告主题 )   |
|---|---|
| Elena Basan; Alexander Basan; Oleg Makarevich                                       | Detection of anomalies in the robotic system based on the calculation of Kullback-Leibler divergence  |
| Yanbing Xiao; Yingzhou Zhang; Yuxin Sun; Junyan Qian                                | Multi-UAV Formation Transformation Based on Improved Heuristically-Accelerated Reinforcement Learning |
| Yao Sun; Lei Zhang; Gang Feng; Bowen Yang; Bin Cao; Muhammad Imran                  | Performance Analysis for Blockchain Driven Wireless IoT Systems Based on Tempo-Spatial Model          |
| Annv Liu; An Wang; Yongyin Dong; Ying Shi; Caisen Chen; Guoshuang Zhang             | Power Attack and Evaluation on Elliptic Curve Cryptosystem in a Commercial Smart Card                 |
| Sinan Chen; Sachio Saiki; Masahide Nakamura   | Recognizing Fine-Grained Home Contexts Using Multiple Cognitive APIs                                  |
| Qiong Liu; Pengxiang Hua; Awais Sultan; Longzhang Shen; Egon Mueller; Frank Boerner | Study of the integration of robot in Cyber-Physical Production Systems                                |
| Ge Gao; Yingzhou Zhang; Junyan Qian; Yuxin Sun                                      | The Lightweight System for UAV Cooperative Mission Planning Simulation                                |

# International Conference on Cyber-Enabled Distributed Computing and Knowledge Discovery

## Session 9: Optimization Theory and Applications

Session Chair – Guangxia Xu - Chongqing University of Posts and Telecommunications, China

Conference Room 5 (十五楼总统会见室 - 15F Presidential Meeting Room), 13:00 — 15:40 October 18

| Authors (包括演讲人)  | Paper Titles (报告主题)   |
|--|---|
| Yu Pan; Qianqian Ren; Jinbao Li; Hu Jin                        | Dynamic Ring Structure Based Target Localization Algorithm in Wireless Sensor Networks              |
| Jingtong Ge  | Generalization of Quantum Strassen Theorem  |
| Yuxin Sun; Yingzhou Zhang; Junyan Qian                         | Program Slicing Method of LLVM IR Based on Information-Flow Analysis                                |
| Emilio Nakamura; Sérgio Ribeiro                                | Risk-Based Attributed Access Control Modelling in a Health Platform - Results from Project CityZen  |
| Zailong ZHANG; Zhiwei CHEN                                     | Supply-Demand Collaborative Energy Internet for Smart City: A Three-Stage Stackelberg Game Approach |
| Mingchang Xu; Zhenbing Liu; Zimin Wang; Long Sun; Zhibin Liang | The Diagnosis of Alzheimer's Disease Based on Enhanced Residual Neural Network                      |
| Wei Ma; Hongzhi Yu; Kun Zhao; Deshun Zhao; Jun Yang; Jing Ma   | Tibetan location Name Recognition Based on BiLSTM-CRF Model   |
| Tinghui Huang; Yong Ding; Zhen Wang; Huijiao Wang              | Ultralightweight RFID Authentication Protocol Based on Permutation Matrix Encryption                |
| Huifang Wang; Zhihong Zhang                                    | A TSGP-based Tip Search Optimization Algorithm  |

## Session 10: Big Data, Analytics, Quality and Performance

Session Chair – Bin Xie, InfoBeyond Technology, USA

Conference Room 5 (十五楼总统会见室 - 15F Presidential Meeting Room), 15:50 – 18:30, October 18

| Authors (包括演讲人)   | Paper Titles (报告主题)   |
|---|---|
| Sandro Passarelli; Cem Gündogan; Lars Stiemert; Matthias Schopp; Peter Hillmann | NERD: Neural Network for Edict of Risky Data Streams  |
| Yinna Ye, Li Chen, and Feng Xue   | Passenger Flow Prediction in Bus Transportation System using ARIMA Models with Big Data                 |
| Bo Liu; Yuhao Sun; Bo Liu   | Translational Bit-By-Bit Multi-Bit Quantization for CRNN on Keyword Spotting                            |
| Chengchang Wan; Xinghui Cao; Wei Wu   | Vertical Stratification of Seawater in the Southern South China Sea in Winter Based on Cluster Analysis |
| Chuang Ma; Linfeng Li; Daiqi Zhou   | Water Quality Prediction of Small Watershed Based on Wavelet Neural Network                             |

## Exploration of Guilin

**Notice:** Due to diverse of individual consideration for the traveling, CyberC would not organize any travel group. October 18, Professor Ding Yong will provide an overview of Guilin (See Page 16, 8:00 - 8:20 AM). Further, we collected some information that may be useful for. However, all the following information (include the agency) is only for your reference.

**Traveling Agency:** 刘文洁 (Wenjie Liu) - Phone: 13737713161; Email: 1318526879@qq.com

### Guilin- A place where you can get drunk without drinking

A 漓江+银子岩 优惠价：350元/人 (含景区门票，三星船票，船上简(午)餐，旅游空调大巴车，导游)

- 上午8:00左右起程赴磨盘山(40分钟)，从磨盘山乘船游览百里画廊-漓江(63KM,约4.5小时磨盘山-阳朔)沿途欣赏：杨堤风光、浪石仙境、九马画山，抵达阳朔后自行前往上车点乘车到银子岩；银子岩距世界旅游明珠桂林市中心85公里，距中国旅游名县阳朔县县大约40分钟车程。1999年初对外开放，是国家AAAA级景区、首批“桂林市文明旅游风景区示范点”，是桂林旅游圈新出现的一颗璀璨明珠，也是桂林现最大的岩洞。有俗话说：“游了银子岩，一世不缺钱”之称。

游完漓江可延续性游览

印象刘三姐： 优惠价：205元/人(新贵宾票)，295元/人(老贵宾票)

- 印象刘三姐：《印象·刘三姐》是一次与真象无关的艺术呈现，以山水圣地桂林山水美丽的阳朔风光实景作为舞台和观众席，以经典传说《刘三姐》为素材，以文化英雄张艺谋为总导演，集惟一性、艺术性、震撼性、民族性、视觉性于一身，是一次演出的革命，一次视觉的革命，是桂林山水的美再一次的与艺术相结合！

注：含阳朔回桂林大巴车费。

B龙脊梯田一日游 优惠价290元/人(含景区门票，转换车，长发表演，索道往返，旅游大巴车费)

- 早上乘车前往龙胜—龙脊，途行驶约1小时20分钟抵达龙脊景区，游览天下一绝的龙脊梯田风光，梯田如链似带，从山脚盘绕到山顶，小山如螺，大山似塔，层层叠叠，高低错落，线条行云流水潇洒柔畅，规模磅礴壮观。

C市区景点-象鼻山 优惠价55元/人(景区门票)

- 象鼻山位于桂林市区两条美丽江河——漓江和桃花江交汇处，是桂林市的象征,在桂林所有的山中是最象形的一座,山平地拔起，酷似一头江边饮水的大象；

D夜游两江四湖 优惠价180元/人(空调船票)

- 桂林两江四湖景区，是漓江(市区段)、桃花江、木龙湖、桂湖、榕湖、杉湖构成的环城风景带，桂林夜景已经成为世界上最璀璨的夜景之一，其璀璨度堪称威尼斯水城。南宋著名词家刘克庄咏叹桂林“千山环野立，一水抱城流”，游客日夜可乘船游环城饱览桂林秀色，那些岛屿、绿树、亭台水榭、曲桥衔引、湖光山色在奇幻彩光下，变得色彩斑斓，扑朔迷离，月光、灯光与实景，浑然一体，四湖成了人间仙境。

E芦笛岩 优惠价80元/人(景区门票)

- 芦笛岩距市中心5公里，是一个以游览岩洞为主、观赏山水田园风光为辅的风景区。从唐代起，历代都有游人踪迹，现洞内存历代壁画77则。自1959年发现并开发后，如今已建有餐厅、茶室、水榭、湖池、曲桥，并设游船，广植花木，成为中外游客游览桂林时必至的旅游热点。

F王城独秀峰 优惠价80元/人(景区门票)

- 靖江王城坐落于广西壮族自治区桂林市漓江西岸，是明朝藩王靖江王朱守谦的藩王府，始建于洪武五年(公元1372年)洪武二十五年(公元1392年)年建成，靖江王城外有国内保存最完好的明代城墙。由于靖江王城地处桂林市城市中心地区，因而有“阅尽王城知桂林”之说。

(Content in Page 21—translated by Google —please reference only )

Plan A: Minjiang + Yinziyan Price: 350 yuan / person (including scenic spots tickets, Samsung tickets, Jane on board (noon) meals, travel air-conditioned bus, tour guide)

- Depart from Mopanshan (40 minutes) at around 8:00 am, take a boat trip from Mopanshan to visit Baili Gallery - Lijiang (63KM, about 4.5 hours Mopanshan - Yangshuo) to enjoy along the way: Yangdi scenery, Langshi Wonderland, Jiu Ma Painting the mountain, after arriving in Yangshuo, go to the pick-up point and take a bus to Yinziyan; Yinziyan is 85 kilometers away from the center of Guilin, the world tourism pearl, and about 40 minutes away from Yangshuo County, a famous tourist county in China. It was opened to the public in early 1999. It is the national AAAA-level scenic spot and the first batch of "Guilin Civilized Tourism Scenic Spot Demonstration Site". It is a new bright pearl in Guilin Tourism Circle and the largest cave in Guilin. There is a saying that "you traveled to Yinziyan, and there is no shortage of money in the world."

Continuing tour of the Lijiang River

Impression Liu Sanjie: Price: 205 yuan / person (new VIP ticket), 295 yuan / person (old VIP ticket)

- Impression Liu Sanjie: "Impression·Liu Sanjie" is an artistic expression unrelated to the true image. The beautiful Yangshuo scenery of the landscape of the mountains and rivers is the stage and the audience. The classic legend "Liu Sanjie" is used as the material, and the cultural hero Zhang Yimou is the general director. The uniqueness, artistry, shock, nationality and visuality are the revolution of a performance, a visual revolution, and the beauty of Guilin's landscape is once again combined with art!

Note: Including the Yangshuo Guilin bus fare.

Plan B: Longji Rice Terrace Day Tour Special price 290 yuan / person (including scenic spot tickets, conversion car, long hair show, cableway round trip, tour bus fare)

- In the morning, take the bus to Longsheng-Longji. You will arrive at Longji Scenic Spot in about 1 hour and 20 minutes. You can visit the scenery of Longji Terraced Fields. The terraces are like chains. From the foot of the mountain to the top of the mountain, the hills are like snails and mountains. Like a tower, the layers are stacked, the height is staggered, the lines are flowing and the water is smooth and smooth, and the scale is magnificent.

Plan C: City attractions - Elephant Trunk Hill Price 55 yuan / person (view tickets)

- Elephant Trunk Hill is located in the beautiful rivers of Guilin City - the junction of Minjiang River and Taohua River. It is the symbol of Guilin City. It is the most pictographic one in all the mountains of Guilin. The mountain is flat and rises like a big riverside drinking water. Elephant

Plan D: Night tour two rivers and four lakes, the price of 180 yuan / person (air-conditioned ticket)

- Guilin Liangjiang and Sihu Scenic Area is a scenic belt surrounded by Lijiang River (city section), Taohua River, Mu-long Lake, Guihu Lake, Wuhu Lake and Shanhu Lake. Guilin night view has become one of the most beautiful night scenes in the world. The twist is called the Venice Water City. Liu Kezhuang, a famous poet in the Southern Song Dynasty, sighed Guilin. "Thousands of mountains are surrounded by wild mountains and one city is surrounded by water." Visitors can enjoy the beautiful scenery of Guilin by boat around the city day and night. Those islands, green trees, pavilions, curved bridges, lakes and mountains Under the magical light, it became colorful, confusing, moonlight, light and real scene, all in one, the four lakes became a fairyland on earth.

Plan E: Reed Flute Rock Price 80 yuan / person (view ticket)

- Reed Flute Rock is 5 km away from the city center. It is a scenic spot with a visit to the cave and the scenery of the mountains and rivers. Since the Tang Dynasty, there have been traces of tourists in the past dynasties. Since its discovery and development in 1959, it has now established restaurants, tea rooms, otters, lakes, and bridges, as well as boating and planting flowers, making it a must-see tourist attraction for Chinese and foreign tourists visiting Guilin.

Plan F: Wangcheng Duxiufeng Special price 80 yuan / person (view ticket)

- Jingjiang Wangcheng is located in the west bank of the Lijiang River in Guilin City, Guangxi Zhuang Autonomous Region. It was the king of the Ming Dynasty, Wang Jingjiang Wang Zhu Shouqian, and was built in Hongwu Five Years (AD 1372) Hongwu twenty-five (AD 1392) year. Jingjiang Wangcheng On the periphery, there are the best-preserved Ming Dynasty walls in China. Since Jingjiang Wangcheng is located in the center of Guilin City, there is a saying that "reading the city of Guicheng".