

**The 2018 Special Session on Collaborative Computing  
with Cloud and Client Workshop (C4W 2018)  
Guangzhou University, Guangzhou, China**

**Guangzhou University  
October 6-8, 2018, Guangzhou, China**



# (The 2018 Special Session on Collaborative Computing with Cloud and Client Workshop, C4W 2018)

## **Summary of the Conference**

Along with the rapid development of Internet technology, new network-based computing modes represented by cloud computing have emerged. They expand the computer systems in space by means of networks, improve the adaptability of clients in the aspect of services, and make a big step towards the ultimate goal of on-demand services and resource sharing. However, in the highly dynamic network environment where user requirements are increasingly changeable, existing computing modes cannot meet the requirements of businesses, due to some limitations. When facing massive service requests, the mainstream cloud computing mode is vulnerable to the performance bottleneck at the server side, due to the intensive demand for computing, storage and network bandwidth resources in the open service mode of network computing. Moreover, the security problem is becoming more serious along with the increasing complexity of the software and hardware components in network computing. Therefore, it is urgent to study new service modes of network computing, give full play to the advantages of various computing models, and provide users with efficient and secure services through collaboration of cloud and clients.

Cloud-client collaborative computing is one of the most popular research fields in network computing. Although the new computing modes including cloud computing are widely applied and rapidly developed in recent years, there is still large room for us to improve our understanding of the architecture of these computing models and combine them with applications. In order to provide more competitive and distinctive products

and technology solutions, we must try to solve core technical difficulties, develop key products, master core technologies of software and hardware in cloud-client collaborative computing platform, implement its industrialization, and fundamentally improve the level of development and information security in Internet, especially in mobile Internet.

The 2018 Special Session on Collaborative Computing with Cloud and Client Workshop (C4W 2018) will be held in Guangdong Hotel, October 6-8, 2018, hosted by Guangzhou University (<http://trust.gzhu.edu.cn/>). It will provide a communication platform for us to demonstrate novel ideas and to learn from each other.

C4W Conference web site:

<http://www.smart-world.org/2018/c4w/>

(The 2018 Special Session on Collaborative Computing with  
Cloud and Client Workshop, C4W 2018)  
**Conference Agenda (Invited Talks)**

**October 7, 2018 (Sunday)**

**Yingchun Hall (迎春厅) on the second floor of Guangdong Hotel**

14:00-14:10	<b>Opening of the Conference</b> Guangzhou University, Guojun Wang	Chair: <b>Tian Wang</b> Huaqiao University
14:10-14:45	<b>Toward Model-Based Environment Perception for Self-Adaptive Software Systems</b> Speaker: Xiaoxing Ma, Nanjing University, China	
14:45-15:20	<b>Crowdsourcing Systems through Exploiting Social Networks</b> Speaker: Yufeng Wang, Nanjing University of Posts and Telecommunications, China	
15:20-15:55	<b>Revisiting Job Scheduling in Large-scale Data Centers from Power Perspective</b> Speaker: Yuhui Deng, Jinan University, China	
15:55-16:15	<b>Coffee/Tea Break</b>	
16:15-16:50	<b>When Sensor-Cloud Meets Fog Computing</b> Speaker: Tian Wang, Huaqiao University, China	Chair: <b>Yuhui Deng</b> Jinan University
16:50-17:25	<b>Big Data Processing: Platforms and Applications</b> Speaker: Weishan Zhang, China University of Petroleum, China	
17:25-18:00	<b>Opportunity and Challenge of Big Data in Power System</b> Speaker: Jingsheng Lei, Shanghai University of Electronic Power, China	
18:30-20:00	<b>Dinner</b>	

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## Conference Agenda

<b>October 8, 2018 (Monday)</b>		
<b>Xijiang Hall (西江厅) on the third floor of Guangdong Hotel</b>		
<b>Session C4W-1: 8:30-10:00</b>	<b>Task Scheduling for Cloud Based Cyber-Physical Systems</b> Dandan Lai, Lichen Zhang, Bingqing Xu and Chunyao Liu	<b>Chair: Feng Wang</b> China University of Geosciences
	<b>An Optimization Strategy for Improving Security in Steganography</b> Xiancheng Wu and Shunquan Tan	
	<b>Leaks or Not: A Framework for Evaluating Cache Timing Side Channel Attacks in SGX</b> Wei Zheng, Ying Wu, BaoLei Mao, XiaoXue Wu	
	<b>Calligraphy: A Mobile Device Based Annotation Tool Supporting Learner Crowdsourcing</b> Qingcheng Li, Heng Cao, Guangming Zheng and Ye Lu	
	<b>Data Offloading for Deadline-Varying Tasks in Mobile Edge Computing</b> Zhipeng Gao, Jie Meng, Qian Wang and Yang Yang	
<b>10:00-10:20</b>	<b>Coffee/Tea Break</b>	
<b>Session C4W-2: 10:20-12:30</b>	<b>Generalized Nash Equilibrium Model of the Service Provisioning Problem in Multi-cloud Competitions</b> Peini Liu, Xinjun Mao, Fu Hou and Shuai Zhang	<b>Chair: Yingkai Zhao</b> Central South University
	<b>Toward An Efficient Cache Management Framework</b> Xuewei Niu and Kun Ma	
	<b>Distributed Data Collection in a Cyclic MobiSpace</b> Yong-Yan Cui, Sheng Zhang and Zhi Ma	
	<b>Mal-warehouse: a Data Collection-as-a-service of Mobile Malware Behavioral Patterns</b> Vasileios Kouliaridis, Konstantia Bampatsalou, Georgios Kambourakis and Guojun Wang	
<b>12:30-13:30</b>	<b>Lunch</b>	

# Meeting Information

## Conference signing

Please sign in the lobby of Guangdong Hotel. Check-in time: 8:00 a.m. - 6:00 p.m. on October 6, 2018. Please contact the meeting group directly from the arrival of the above time.

## Meeting accommodation arrangements

The accommodation of this meeting is Guangdong Hotel, located at 309 Dongfeng Middle Road, Yuexiu District, Guangzhou. The accommodation room of this meeting is arranged by the meeting group. If there are special requirements, please consult with the meeting group.

## Dinner

This meeting will provide a meeting for the participants to dine from October 6-8. Among them, breakfast and Chinese food are buffet meals. Dinner is a table meal.

## Meeting and ticketing

In principle, the meeting will not provide pickup/dropoff and ticketing services for the participants. If you have any special requirements, please contact the meeting group.

## Contact

Dr. Shuhong Chen: Mobile: 15102094896; EMAIL: [shuhongchen@gzhu.edu.cn](mailto:shuhongchen@gzhu.edu.cn).

# Invited Talk by Prof. Xiaoxing Ma of Nanjing University



**Time :** 14:10-14:45, October 7, 2018 (Sunday)

**Meeting Room :** Yingchun Hall (迎春厅) on the second floor of Guangdong Hotel

**Invited Speaker :** Prof. Xiaoxing Ma, Nanjing University, China

**Title :** Toward Model-Based Environment Perception for Self-Adaptive Software Systems

**Abstract :** Effective and efficient perception of the environment in which a software system is situated is crucial for the self-adaptation of the system. However, software engineering so far is mainly focused on building machines exhibiting desired behavior, but not machines recognizing and predicting environmental behavior. Based on a metaphor of epistemology, we propose a preliminary software perception framework that takes environment meta-models and specifications as a priori knowledge and derives at runtime a posteriori model instances for event detection and prediction. We also show how this framework applies to the perception of complex events in distributed environment. This talk is to provoke a discussion about the challenges of disciplined software engineering, especially specification and modeling, for environment perception.

**Biography :** Xiaoxing Ma is a professor in the Department of Computer Science and Technology, and the deputy director of the Institute of Computer Software, Nanjing University, China. He received his PhD degree from the same University in 2003. His research interests include self-adaptive software systems, software architectures and middleware systems. He co-authored more than 80 peer-reviewed papers, some of which were published in major software engineering conferences and journals such as FSE/ICSE/ASE and IEEE TSE/TC/TPDS. He has directed and participated over a dozen research and development projects funded by national level agencies, and won two National Science and Technology Progress Awards in 2006 and 2011, respectively.

# Invited Talk by Prof. Yufeng Wang of Nanjing University of Posts and Telecommunications



**Time :** 14:45-15:20, October 7, 2018 (Sunday)

**Meeting Room :** Yingchun Hall (迎春厅) on the second floor of Guangdong Hotel

**Invited Speaker :** Prof. Yufeng Wang, Nanjing University of Posts and Telecommunications, China

**Title :** Crowdsourcing Systems through Exploiting Social Networks

**Abstract :** Crowdsourcing has proved to be a splendid tool to aggregate the knowledge from a pool of individuals in order to perform abundant microtasks efficiently. Recently, with the explosive growth of online social network, Word of Mouth (WoM)-based crowdsourcing systems have emerged, in which besides conducting the tasks by themselves, participants simultaneously recruit other individuals through exploiting their social networks to help solve crowdsourced tasks. This crowdsourcing paradigm can greatly facilitate to grow the pool of crowdworkers. This talk firstly discuss the main challenges in WoM-based crowdsourcing system: Peer Recruitment, Incentive Design, Privacy and Security, Data Quality Control, etc. Then, considering there exist two conflicting challenges in designing an effective WoM-based incentive mechanism: 1) sybil attack and 2) heterogeneous effect of participants. That is, intuitively, incentivizing (usually compensating for) common-ability individuals will inevitably stimulate the behavior of sybil attack (i.e., some individuals create multiple sybils, and split the total efforts into those sybils to expect more compensation). To solve the issue, we will introduce our designed solution, BciNet: A Biased Contest-Based Crowdsourcing Incentive Mechanism.

**Biography :** Yufeng Wang currently is Full Professor in Nanjing University of Posts and Telecommunications, China. From March 2008 to April 2011, he acted as Expert Researcher in National Institute of Information and Communications Technology (NICT), Japan. From August 2011 till now, he has been a guest researcher at Media Lab and Department of Human Informatics and Cognitive Sciences, Waseda University, Japan.

He has published more 100 academic papers in English, including 30+ reputable journal papers appeared on IEEE trans., ACM trans., and published two monographs

books in the fields of mobile social networking and proximity service. His research interests focus on Algorithmic mechanism design and data science, cyber-physical-social systems, mobile crowdsourcing systems, machine learning and AI, etc.

# Invited Talk by Prof. Yuhui Deng of Jinan University



**Time :** 15:20-15:55, October 7, 2018 (Sunday)

**Meeting Room :** Yingchun Hall (迎春厅) on the second floor of Guangdong Hotel

**Invited Speaker :** Prof. Yuhui Deng, Jinan University, China

**Title :** Job Scheduling in Large-scale Data Centers from Power Perspective

**Abstract :** The explosive growth of Internet of Things is generating massive data which continues to move into data centers.

These incrementally scalable datacenters are very different from traditional hosting facilities. They cannot be treated as a collection of servers that simply work together. For example, the power consumption has become a very important challenge of designing modern data centers. Therefore, in order to deliver required QoS, the hardware resources, software resources, and the corresponding power residing in these data centers must be treated in a holistic way. This talk will first present how to model the air flow of modern data centers. By leveraging the model of air flow, this talk will introduce how to build a power model which can minimize the overall power consumption of data centers by balancing the computing power and cooling power. Finally, how to correlate the job scheduling, heat recirculation, inlet temperature, and cooling cost to construct a holistic power model will be discussed.

**Biography :** Yuhui Deng is a professor at the Computer Science Department of Jinan University. Before joining Jinan University, he worked at EMC Corporation as a senior research scientist from 2008 to 2009. He worked as a research officer at Cranfield University in the United Kingdom from 2005 to 2008. He received his Ph.D. degree in computer science from Huazhong University of Science and Technology in 2004. He has authored and co-authored two book chapters and more than 90 refereed academic papers including ACM Computing Surveys, IEEE TPDS, IEEE TOC, IEEE TCC, IEEE TBD, IEEE TOM, IEEE TGRS, ICCD, MASCOTS, CF, ICPADS, etc. He received the best paper award from Alibaba Cloud Computing-CCF information storage committee in 2018, from JISE in 2007, from the 16th National Storage Conference in 2010. He was on the finalist and awarded of EMC Global Innovation Showcase in 2008. He was on the Storage

Challenge Finalist at ACM/IEEE Super Computing (SC07) in 2007. He holds over 30 authorized and pending patents. His research interests cover green computing, cloud computing, information storage, computer architecture, performance evaluation, etc.

# Invited Talk by Prof. Tian Wang of Huaqiao University



**Time :** 16:15-16:50, October 7, 2018 (Sunday)

**Meeting Room :** Yingchun Hall (迎春厅) on the second floor of Guangdong Hotel

**Invited Speaker :** Prof. Tian Wang, Huaqiao University, China

**Title :** When Sensor-Cloud Meets Fog Computing

**Abstract :** Sensor-Cloud system, which is a combination of both cloud computing and WSNs, has become the research focus. Trustworthy data collection is crucial for Sensor-Cloud system, since it is relevant to upper-layer data protections and applications. However, for one thing, the ability of underlying sensor networks is too weak to afford both computation and storage abilities. For another, cloud computing cannot manage the underlying physical sensors and data directly. Thus the current methods cannot collect data efficiently and trustworthily. In this talk, we introduce to exploit the advantages of fog computing and use some super nodes to form the fog layer and take full advantages of their computation, storage and mobility abilities. We will focus on: 1) Designing fine-grained direct trust evaluation method to distinguish trustworthy sensors; 2) Designing the mobile data collection method, which is based on “trust virtual force”; 3) Designing the outlier detection based data selection method, to extract trustworthy data; 4) Designing the Hash-Solomon coding method to store the data trustworthily. We believe that, this research will promote the merge and applications of both wireless sensor networks and cloud computing, which is not only a complement and improvement for Sensor-Cloud technology and theory, but also a practice and verification for fog computing model.

**Biography :** Tian Wang is currently working as a full professor at Huaqiao University. He is also a guest researcher at Waseda University (Japan), and a visiting fellow at the “National Key Laboratory – (Smart City Internet of Things)” in the University of Macau. He received his PhD degree in computer science from City University of Hong Kong (2017-2018 ranked 49th in the World, QS). He received the B.E. and M.E. degrees from Central South University, Changsha, China, in 2004 and 2007 respectively. In particular, his master thesis was awarded the title of “Outstanding Master's Thesis of Hunan

Province”.

He is a senior member of China Computer Federation (CCF), and also a CCF specialized committee member for both Internet of Things and Pervasive Computing. He is the chair of CCF YOCSEF (Xiamen) from 2018-2019. He is also the “Outstanding Young Scientists in Colleges and Universities” in Fujian Province, “High-quality Overseas Professionals” in Xiamen, and “High-level Talents” in Quanzhou. In 2006, he was selected through the “Mainland Talents Program” in Hong Kong and worked as a research assistant at City University of Hong Kong for 2 years. His current research interests include Internet of Things, Cloud Computing, and Fog Computing. He has 10 patents and has published more than 170 papers in high-level journals such as IEEE Communications Magazine, IEEE Transactions on Mobile Computing, IEEE Transactions on Vehicular Technology, ACM Transactions on Sensor Networks, ACM Transactions on Cyber-Physical Systems, Computer Networks, Information Sciences, etc., and some well-known international conference such as ACM MobiHoc, IEEE RTSS, IEEE MASS, IEEE ICC, IEEE WCNC, etc.. Among these papers, more than 60 are indexed by SCI. He has more than 1700 citations, according to Google Scholar. His H index is 18 and the i10 index is 37. He has managed 5 national natural science projects (including 2 sub-projects) and 4 provincial-level projects. He won the second prize of the natural science award of Hunan Province for his contribution on “The Trustworthy Theories and Methods for New Network Computing” in 2014. He also won the third prize of the Fujian Provincial Natural Science Excellent Paper, in 2016.

# Invited Talk by Prof. Weishan Zhang of China University of Petroleum



**Time :** 16:50-17:25, October 7, 2018 (Sunday)

**Meeting Room :** Yingchun Hall (迎春厅) on the second floor of Guangdong Hotel

**Invited Speaker :** Prof. Weishan Zhang, China University of Petroleum, China

**Title :** Big Data Processing: Platforms and Applications

**Abstract :** Big data processing is increasingly important for various industry applications. However, big data processing involves a lot of technologies including supporting cloud platforms, data mining algorithms, data visualization, workflow management, and so on. How to effectively and efficiently integrate these technologies, and provide easy-to-use tools for end users become critical for the success of big data processing. In this talk, we will show our work on the design and development of four different big data processing platforms including big data knowledge mining, deep learning, video processing, and sentiment processing. At the same time, we will demonstrate these platforms with different industry and social applications.

**Biography :** Prof. Weishan Zhang is now a full professor at Department of Software Engineering, China University of Petroleum. He is the director of the 'Innovation Team of Intelligent Big Data Processing' of Huangdao District, Qingdao city, director of 'Research Team of Big Data Processing for Petroleum Engineering'. He was an Associate Professor/Senior Researcher at Computer Science Department, University of Aarhus (til Dec. 2010). He was a visiting scholar of Department of Systems and Computer Engineering, Carleton University, Canada (Jan. 2006 - Jan. 2007). He was an Associate Professor at School of Software Engineering, Tongji University, Shanghai, China (Aug. 2003- June 2007). He was a NSTB post-doctoral research fellow at Department of Computer Science, National University of Singapore (Sept. 2001 to Aug. 2003).

The main research interests include Internet of Things, cloud computing, big data processing, and software engineering. He has published over 100 papers. His current h-index is 15 and i10 index is 27 as in Sept. 2018.

# Invited Talk by Prof. Jingsheng Lei of Shanghai University of Electronic Power



**Time :** 17:25-18:00, October 7, 2018 (Sunday)

**Meeting Room :** Yingchun Hall (迎春厅) on the second floor of Guangdong Hotel

**Invited Speaker :** Prof. Jingsheng Lei, Shanghai University of Electronic Power, China

**Title :** Opportunity and Challenge of Big Data in Power System

**Abstract :** The big data in the power system is not only a technological advancement but also a major transformation in the field of the entire power system. In the era of big data, the transformation involves development concept, management system, and technical route. In addition, it is a leap in the value pattern of smart grids. This report includes two parts. The first part introduces from the origin, connotation, and characteristics, to the application prospect, challenges, the key technologies, and development strategies of big data for the power industry. The second part mainly introduces the related work we have done in the field of big data in power system, including the method of forecast power load driven by data, prediction to customer electricity behavior, analysis to the characteristics of the customer using electricity in their areas, and the big data platform for power monitoring.

**Biography :** Jingsheng Lei is a professor and the Dean of the College of computer science and technology, Shanghai University of Electronic Power. He received his B.S. in Mathematics from Shanxi Normal University in 1987, and MS and Ph.D in Computer Science from Xinjiang University in 2000 and 2003 respectively. He has wide research interests, mainly including Big data in power system, Machine learning, Data mining and Pattern recognition. In these areas he has published more than 100 papers in international journals or conferences. He serves as an Editor-in-Chief of the Journal of Computational Information Systems, Associate Editor of Power systems and Big data. He is the member of the Database Technical Committee of the CCF (China Computer Federation), the member of the Machine Learning Technical Committee of the CAAI (Chinese Association of Artificial Intelligence), the member of the Academic Committee of ACM Shanghai chapter.