

The Tenth International Conference on Advanced Cloud and Big Data (CBD 2022)

Final Program

November 4–5, 2022
Guilin, China

Organized by

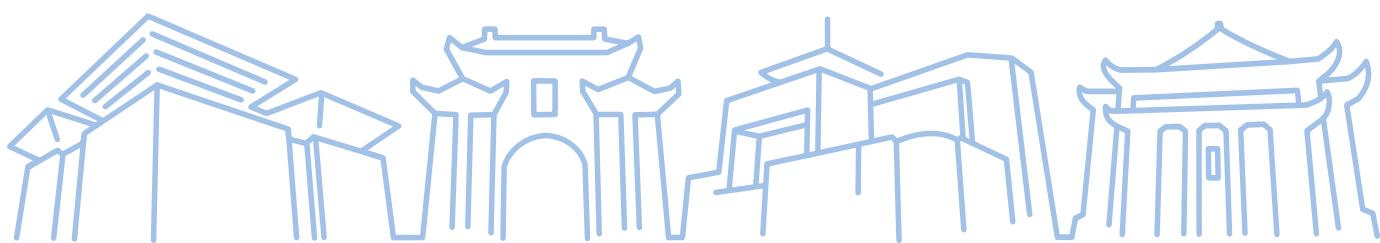


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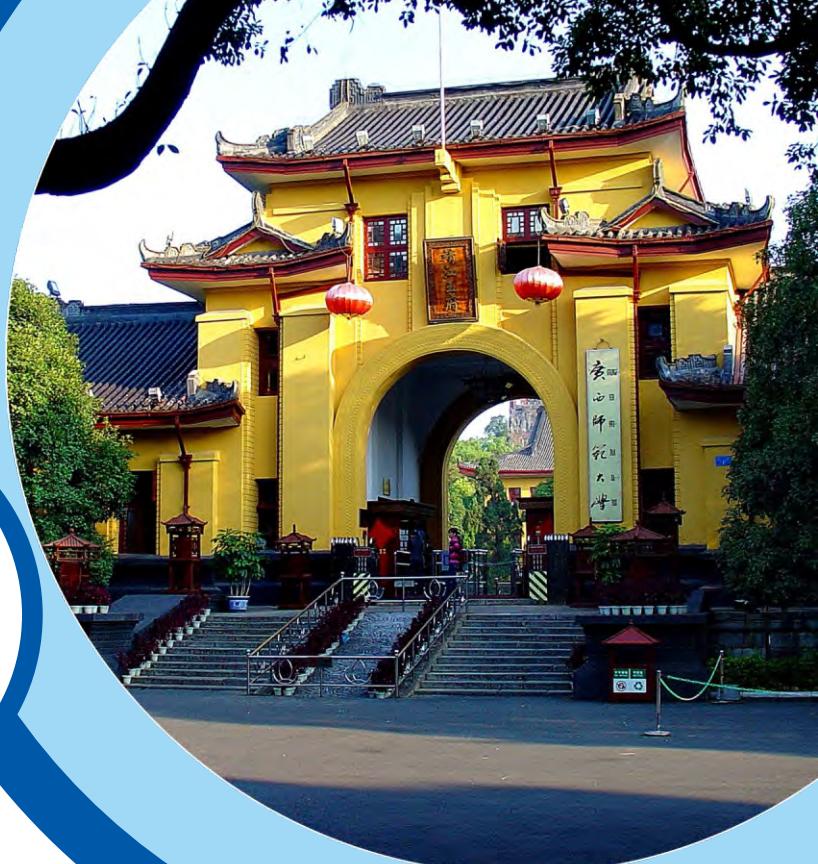
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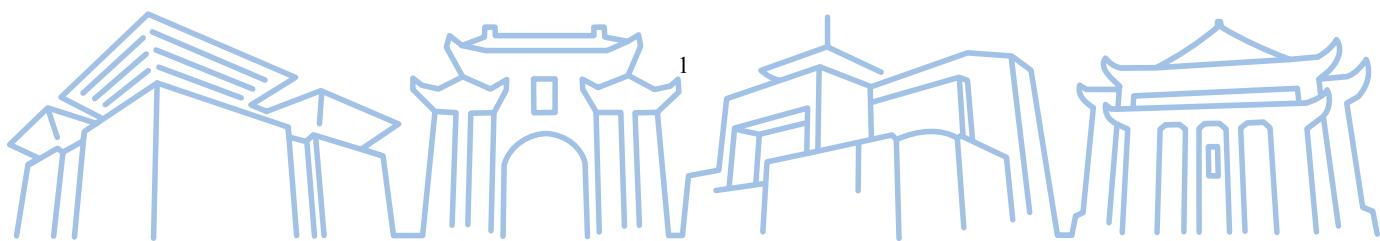




CBD 2022



Welcome Message



Message from Conference Chairs

It is our great pleasure to welcome you to the Tenth International Conference on Advanced Cloud and Big Data (CBD 2022) at Guilin, China. This conference is jointly organized by Guangxi Normal University, Guilin University of Technology and Southeast University to promote the cooperative research on cloud computing and big data between academia and industry.

CBD 2022 is expected to serve as a platform for researchers and practitioners to exchange ideas regarding advancements and practices in cloud and big data. CBD 2022 also covers edge computing, blockchain and artificial intelligence in exploiting recent research advances to solve real-world problems. All participants are expected to obtain rewarding experiences as well as to have much fun during CBD 2022.

A number of people and organizations make great efforts to ensure the success of CBD 2022. First, we would like to express our deepest thanks to all the authors for submitting their papers and the program committee members for their review of the papers.

We highly appreciate Prof. Wenfei Fan from University of Edinburgh, Prof. Guihai Chen from Nanjing University, Prof. Huadong Ma from Beijing University of Posts and Telecommunications, Prof. Laurence T. Yang from Hainan University, Prof. Xiaohui Tao from University of Southern Queensland, Prof. Yunhuai Liu from Peking University, Prof. Chen Tian from Nanjing University, Prof. Keqiu Li from Tianjin University for their keynote speeches. We sincerely give our special thanks to Steering Committee Co-chairs Junzhou Luo, Yi Pan and Laurence T. Yang for their great guidance in organizing this conference. We also thank Program Co-chairs Prof. Xiaohui Tao, Prof. Shichao Zhang, Prof. Xiaolan Xie and Prof. Fang Dong for their great devotion through the paper review process.

Last but not least, we gratefully acknowledge the support from Guangxi Normal University, Guilin University of Technology, Southeast University, ACM Nanjing Chapter, Tsinghua Science and Technology, Jiangsu Computer Society. Finally, we thank all the participants for attending the conference. We hope everyone will enjoy CBD2022.

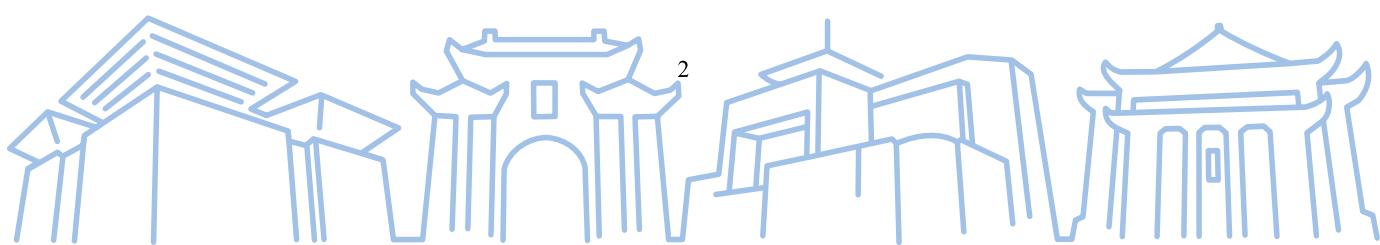
Xianxian Li, Guangxi Normal University, China

Junzhou Luo, Southeast University, China

Yi Pan, Shenzhen Institute of Advanced Technology, Chinese Academy of Science, China

Laurence T. Yang, Hainan University, China

CBD 2022 General Conference Co-chairs



Message from Program Chairs

Welcome to CBD 2022 – the Tenth International Conference on Advanced Cloud and Big Data. The objective of the conference is to bring together researchers and practitioners and bridge the gap between state-of-art research and state-of-practice technologies. We provide a forum for both academics and practitioners working on cloud computing and big data technologies to explore new ideas, share their experiences and leverage each other's perspectives.

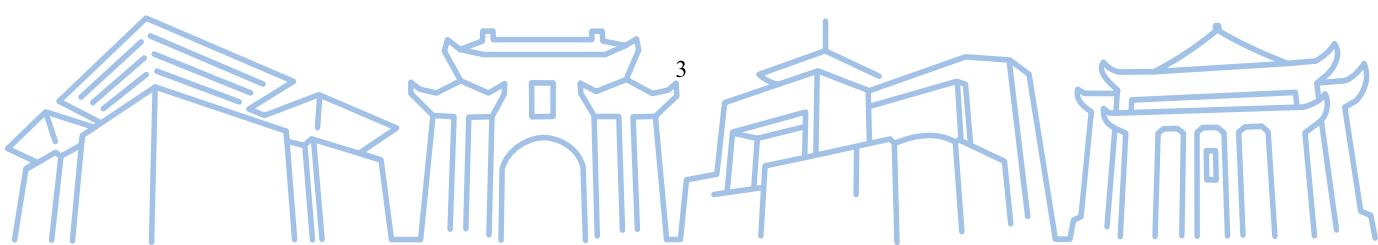
The technical program has 8 keynote addresses and 56 regular papers. They cover a broad spectrum including cloud computing, cloud resource management, cloud data center networking, cloud based deep learning, cloud security and privacy, machine learning and data mining, big data processing and query, data mining in smart applications, edge computing architecture and algorithm, blockchain and its application, machine learning and AI at edge, Graph Learning , AR&VR and etc.

We would like to thank all the authors for sharing their ideas and results with us, and all the members of the Program Committee and reviewers for their help in evaluating and selecting high quality papers. Without their participation, the success of the conference would not be possible.

We thank you for attending the conference and hope that you enjoy the program we have prepared for you.

Xiaohui Tao, University of Southern Queensland, Australia
Shichao Zhang, Guangxi Normal University, China
Xiaolan Xie, Guilin University of Technology, China
Fang Dong, Southeast University, China

CBD 2022 Program Co-chairs

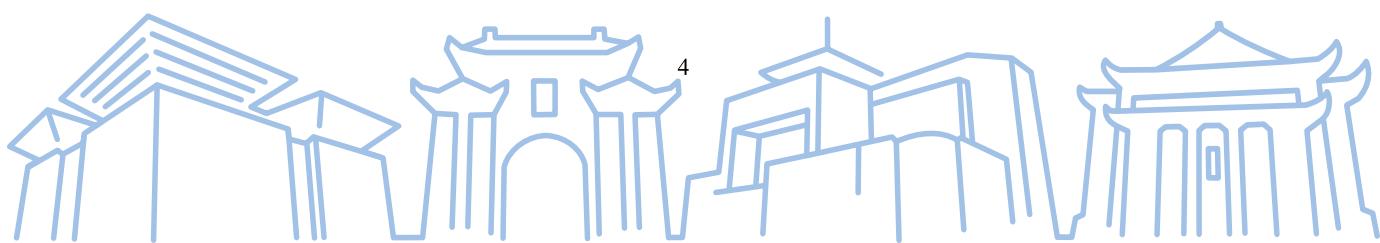




CBD 2022



Organization



CBD 2022 Organization Committee

General Conference Co-Chairs

- Xianxian Li, Guangxi Normal University, China
- Junzhou Luo, Southeast University, China
- Yi Pan, Shenzhen Institute of Advanced Technology, Chinese Academy of Science, China
- Laurence T. Yang, Hainan University, China

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Program Committee Co-Chair

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- Xiaolan Xie, Guilin University of Technology, China
- Fang Dong, Southeast University, China

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- Jingli Wu, Guangxi Normal University, China
- Peng Liu, Guangxi Normal University, China
- Bineng Zhong, Guangxi Normal University, China
- Runqun Xiong, Southeast University, China

Publication Co-Chairs

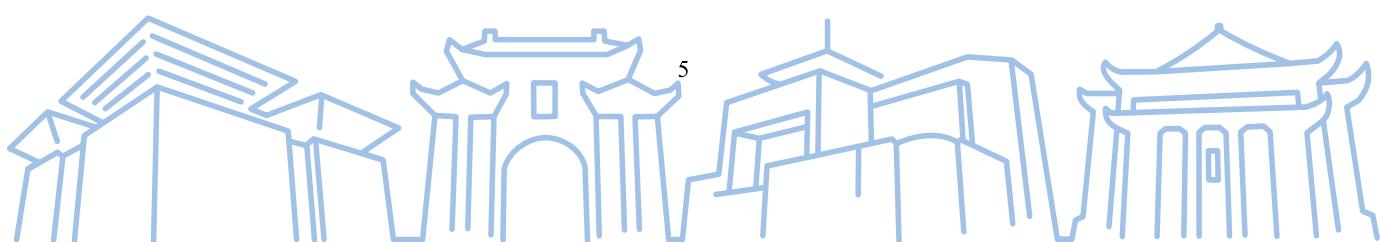
- Zhi Li, Guangxi Normal University, China
- Zhixin Li, Guangxi Normal University, China
- Jinyan Wang, Guangxi Normal University, China
- He Chen, Tsinghua University Press, China
- Jinghui Zhang, Southeast University, China

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- Feng Yu, Guangxi Normal University, China
- Li-e Wang, Guangxi Normal University, China
- Huimin Zhang, Guangxi Normal University, China
- Canlong Zhang, Guangxi Normal University, China

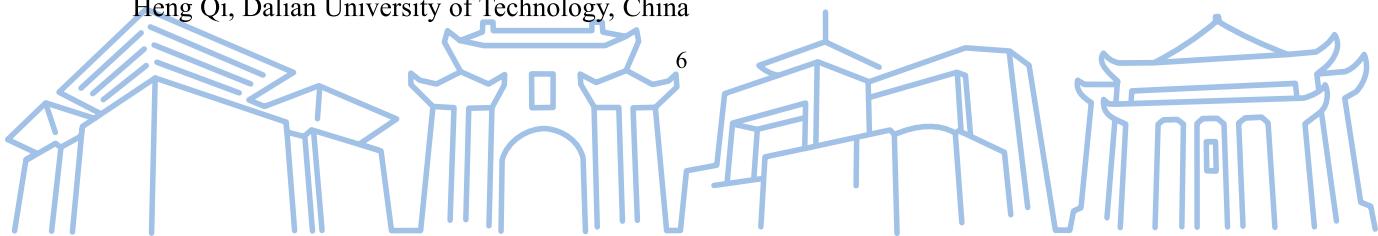
International Steering Committee

- Junzhou Luo, Southeast University, China (Chair)
- Yi Pan, Shenzhen Institute of Advanced Technology, Chinese Academy of Science, China(Chair)
- Laurence T.Yang, Hainan University, China (Chair)

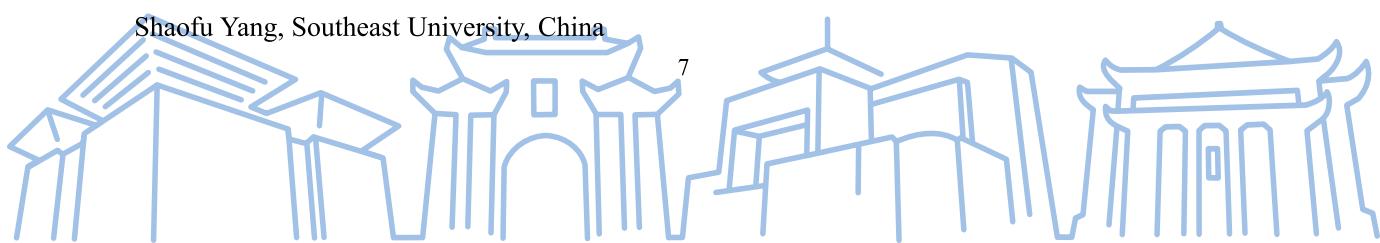


CBD 2022 Program Committee

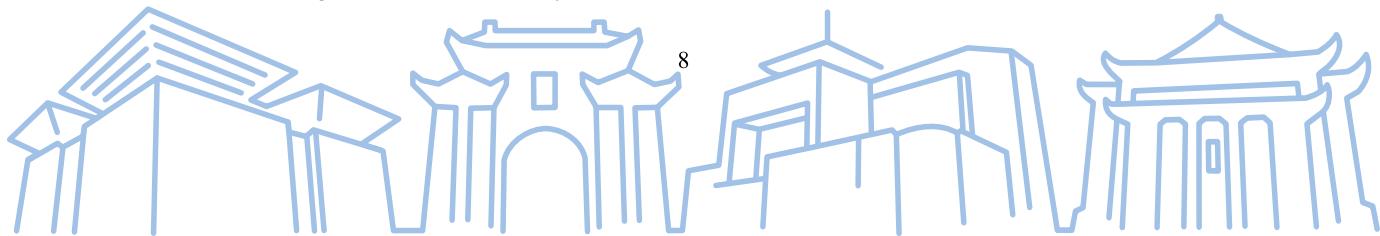
- Bin Zhao, Nanjing Normal University, China
Bineng Zhong, Guangxi Normal University, China
Binghai Wen, Guangxi Normal University, China
Byeungwoo Jeon, Sungkyunkwan University, Korea
Canlong Zhang, Guangxi Normal University, China
Chao Tan, Nanjing Normal University, China
Chaobo He, Zhongkai University of Agriculture and Engineering, China
Cong Wang, Northeastern University, China
Darren Xu, Transaction Network Services, USA
Dayong Ye, Swinburne University of Technology, Australia
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Dezun Dong, National University of Defense Technology, China
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Fan Yang, Google, USA
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Haipeng Dai, Nanjing University, China
Haisheng Tan, University of Science and Technology of China, China
Hang Shen, Nanjing Tech University, China
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Huimin Zhang, Guangxi Normal University, China
Huming Chen, University of Wollongong, Australia
Jiahui Jin, Southeast University, China
Jian Shen, Nanjing University of Information Science and Technology, China
Jian Zhou, Nanjing University of Posts and Telecommunications, China
Jianhua Hu, Guangxi Normal University, China
Jianming Yong, University of Southern Queensland, Australia
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Jinghui Zhang, Southeast University, China
Jingli Wu, Guangxi Normal University, China
Jingya Zhou, Soochow University, China
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Jiyun Li, Donghua University, China
Jun Shen, University of Wollongong, Australia
Junwu Zhu, Yangzhou University, China
Kaigui Bian, Virginia Polytechnic Institute and State University, USA
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Liang Liu, Beijing University of Posts and Telecommunications, China
Li-e Wang, Guangxi Normal University, China
Lijuan Wang, Xidian University, China
Lintao Duan, Chengdu University, China
Lu Liu, University of Derby, UK
Lu Zhang, Nanjing University of Finance and Economics, China
Mingfu Xue, Nanjing University of Aeronautics and Astronautics, China
Mingming Lu, Central South University, China
Panlong Yang, University of Science and Technology of China, China
Peijian Wang, Xi'an Jiaotong University, China
Peng Chen, Facebook, USA
Peng Liu, Guangxi Normal University, China
Pengwei Wang, Donghua University, China
Qiang He, Swinburne University of Technology, Australia
Qingguo Zhou, Lanzhou University, China
Qingjun Xiao, Southeast University, China
Qun Jin, Waseda University, Japan
Rui Zhou, Victoria University, Australia
Runqun Xiong, Southeast University, China
Shaofu Yang, Southeast University, China



Sheng Zhang, Nanjing University, China
Shichao Zhang, Guangxi Normal University, China
Siyao Cheng, Harbin Institute of Technology, China
Songtao Guo, Southwest University, China
Tao Xiang, Chongqing University, China
Thomas Rauber, University Bayreuth, Germany
Tian Wang, Huaqiao University, China
Tianzhang Xing, Northwest University, China
Tong Yi, Guangxi Normal University, China
Wanchun Dou, Nanjing University, China
Wei Li, University of Sydney, Australia
Wei Zheng, Xiamen University, China
Wenjia Wu, Southeast University, China
Xiaohui Cheng, Guilin University of Technology, China
Xiang Fei, Coventry University, UK
Xianxian Li, Guangxi Normal University, China
Xiao Fu, Nanjing University of Posts and Telecommunications, China
Xiao Liu, Deakin University, Australia
Xiaobing Sun, Yangzhou University, China
Xiaofan Liu, City University of Hongkong, China
Xiaofei Wang, Tianjin University, China
Xiaohua Tian, Shanghai Jiao Tong University, China
Xiaojiang Chen, Northwest University, China
Xiaolan Xie, Guilin University of Technology, China
Xiaolin Fang, Southeast University, China
Xuanzhe Liu, Peking University, China
Xuejun Li, Anhui University, China
Xuyun Zhang, University of Technology Sydney, Australia
Yifei Lu, Nanjing University of Science and Technology, China
Yuxiang Wang, Hangzhou Dianzi University, China
Zebin Wu, Nanjing University of Science and Technology, China
Zhen Ling, Southeast University, China
Zhenhua Li, Tsinghua University, China
Zhenjun Tang, Guangxi Normal University, China
Zhenkui Shi, Guangxi Normal University, China
Zhi Li, Guangxi Normal University, China
Zhiang Wu, Nanjing University of Finance and Economics, China
Zhigang Sun, Guangxi Normal University, China
Zhigeng Han, Nanjing Audit University, China
Zhixin Li, Guangxi Normal University, China

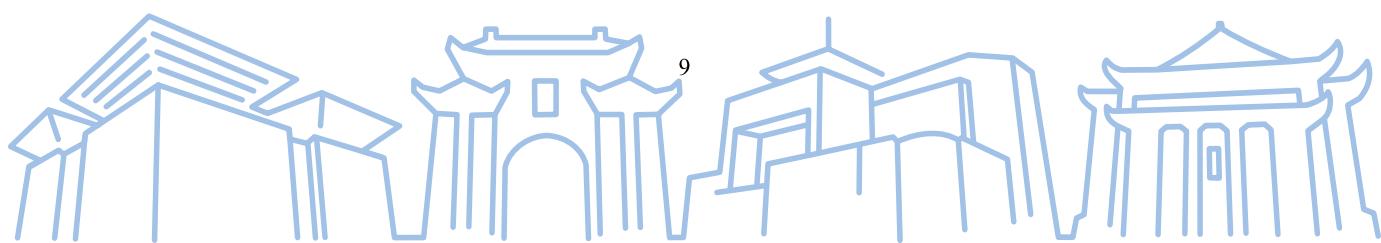




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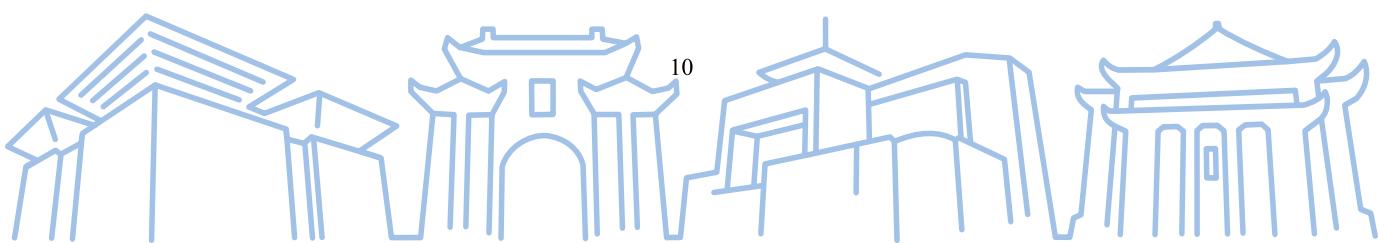


Conference Information



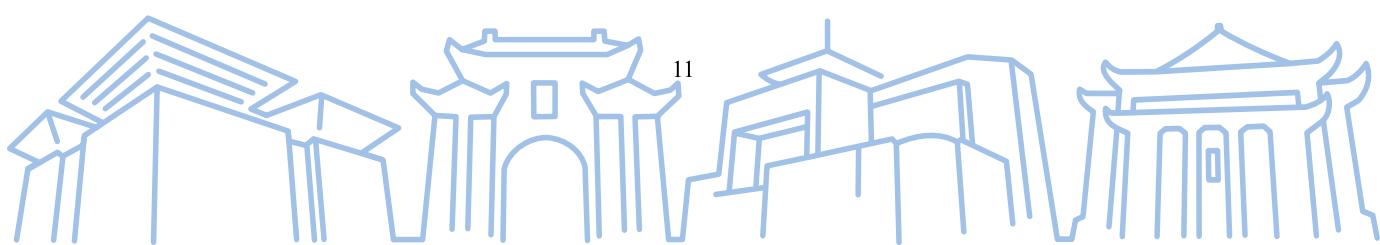
Conference Schedule

Time	Contents	Moderator
4th November, 2022 (Friday)		
JIN GUI ROOM (金桂厅) (Tencent Meeting ID: 793-733-086, PWD: 1104)		
08:30-08:50	Opening Plenary	Prof. Xianxian Li
08:50-09:30	Keynote Speech 1 (Academician Wenfei Fan)	
09:30-10:00	Keynote Speech 2 (Prof. Guihai Chen)	Prof. Junzhou Luo
10:00-10:20	Coffee/Tea Break & Group Photo	
10:20-10:50	Keynote Speech 3 (Prof. Huadong Ma)	
10:50-11:20	Keynote Speech 4 (Prof. Tianruo Yang)	Prof. Yunhuai Liu
11:20-11:50	Keynote Speech 5 (Prof. Xiaohui Tao)	
12:00-13:00	Lunch Buffet	
14:00-15:30	Keynote Speech 6 (Prof. Yunhuai Liu)	
	Keynote Speech 7 (Prof. Chen Tian)	Prof. Kun Xie
	Keynote Speech 8 (Prof. Keqiu Li)	
15:30-15:40	Coffee/Tea Break	
15:40-16:10	ACM SIGCOMM China Handover and Award Ceremony	Prof. Yunhuai Liu
16:10-17:25	ACM SIGCOMM China Young Scholars Forum	Prof. Haipeng Dai
17:30-18:00	GUI HU ROOM (桂湖厅) (Tencent Meeting ID: 726-403-011, PWD: 110402) ACM SIGCOMM China Working Meeting (Closed Door Meeting)	
	Conference Banquet & 10th Anniversary of CBD Conference	



Conference Schedule

Time	Contents		
5th November, 2022 (Saturday)			
	GUI HU ROOM(桂湖厅) Tencent Meeting ID: 498-581-350, PWD:110501	RONG HU ROOM(榕湖厅) Tencent Meeting ID: 724-843-890, PWD:110502	SHAN HU ROOM(杉湖厅) Tencent Meeting ID: 925-844-468, PWD:110503
08:30-10:00	Session 1 Cloud Computing and Applications I	Session 2 Cloud Computing and Applications II	Session 3 Session 3: Machine Learning & Data Mining I
10:00-10:20	Coffee/Tea Break (20 mins)		
	GUI HU ROOM(桂湖厅) Tencent Meeting ID: 498-581-350, PWD:110501	RONG HU ROOM(榕湖厅) Tencent Meeting ID: 724-843-890, PWD:110502	SHAN HU ROOM(杉湖厅) Tencent Meeting ID: 925-844-468, PWD:110503
10:20-11:50	Session 4 Machine Learning & Data Mining II	Session 5 Machine Learning & Data Mining III	Session 6 Cloud Security and Privacy I
12:10-14:00	Lunch Break		
	GUI HU ROOM(桂湖厅) Tencent Meeting ID: 498-581-350, PWD:110501	RONG HU ROOM(榕湖厅) Tencent Meeting ID: 724-843-890, PWD:110502	SHAN HU ROOM(杉湖厅) Tencent Meeting ID: 925-844-468, PWD:110503
14:00-15:30	Session 7 Cloud Security and Privacy II	Session 8 Edge Computing & Miscellaneous	Session 9 Graph Learning& Miscellaneous



Keynote Speeches

Keynote Speech 1:

Title: Getting Practical Value out of Big Graphs

Time: 08:50-09:30 AM, November 4, 2022

Location: Main Conference Room: JIN GUI ROOM (金桂厅),

(Tencent Meeting ID: 793-733-086, PWD: 1104)



Prof. Wenfei Fan

Fellow of the Royal Society, Fellow of the Royal Society of Edinburgh, Member of Academia Europaea, ACM Fellow, Foreign Member of Chinese Academy of Sciences

University of Edinburgh

Shenzhen Institute of Computing Sciences

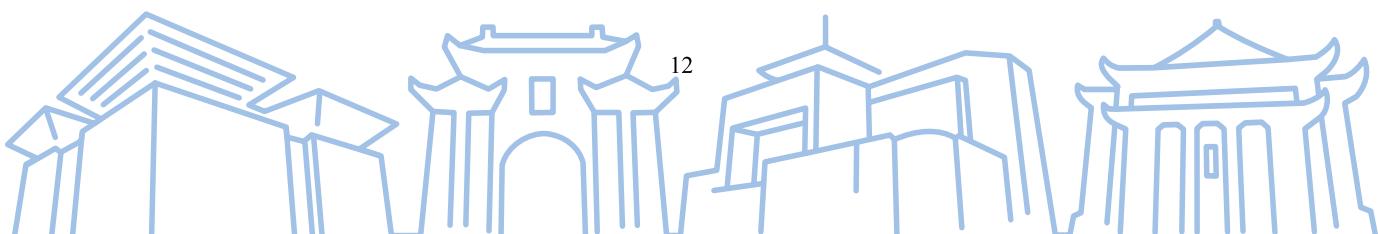
Beihang University

Abstract:

This talk tackles three questions in connection with the Value of big graphs. What practical value can we get out of big graphs? How can we deduce causality and associations from big graphs? Where can we get high-quality graph-structured data? This talk presents Fishing Fort, a system for big graph analytics, which unifies machine learning (ML) and logic deduction by embedding ML models as predicates in association rules. It demonstrates the applications of Fishing Fort in online recommendation, drug discovery, battery manufacturing and graph-data cleaning.

Short Bio:

Professor Wenfei Fan is the Chair of Web Data Management at the University of Edinburgh, UK, and the Chief Scientist of Shenzhen Institute of Computing Science, China. He is a Fellow of the Royal Society (FRS), a Fellow of the Royal Society of Edinburgh (FRSE), a Member of Academia Europaea (MAE), an ACM Fellow (FACM), and a Foreign Member of Chinese Academy of Sciences. He received his PhD from the University of Pennsylvania, and his MSc and BSc from Peking University. He is a recipient of Royal Society Wolfson Research Merit Award in 2018, ERC Advanced Grant in 2015, the Roger Needham Award in 2008 (UK), Yangtze River Scholar in 2007 (China), the Outstanding Overseas Young Scholar Award in 2003 (China), the Career Award in 2001 (USA), and several Test-of-Time and Best Paper Awards (Alberto O. Mendelzon Test-of-Time Award of ACM PODS 2015 and 2010, Best Paper Awards for SIGMOD 2017, VLDB 2010, ICDE 2007 and Computer Networks 2002). His current research interests include database theory and systems, in particular big data, data quality, data sharing, parallel computation, query languages and recommender systems.



Keynote Speech 2:

Title: Challenges and Opportunities of Network Measurements: A Full-Dimensional Perspective

Time: 09:30-10:10 AM, November 4, 2022

Location: Main Conference Room: JIN GUI ROOM (金桂厅),

(Tencent Meeting ID: 793-733-086, PWD: 1104)



Prof. Guihai Chen

Distinguished Professor

Department of Computer Science and Technology

Nanjing University, China

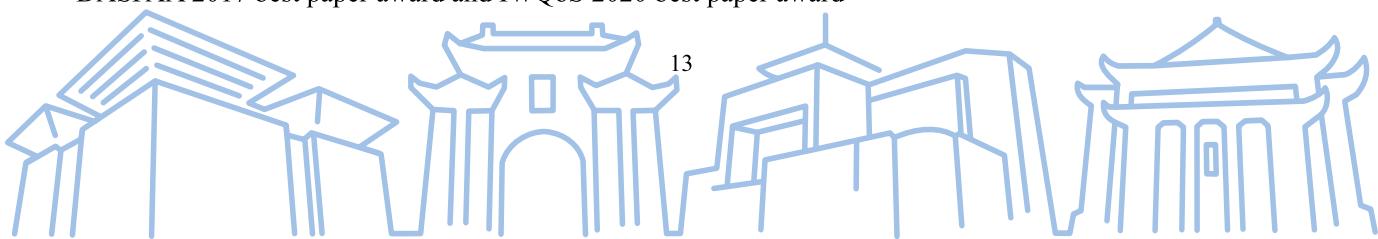
Abstract:

Nowadays, existing network measurement technologies fail to meet high requirements on accuracy, scalability, consistency and compatibility. At the same time, the network infrastructure evolves towards ubiquitous device interfaces, heterogeneous network connections, integrated network identifiers, on-demand networking construction and intelligent decision-making.

This requires further innovation from a full-dimensional perspective, aiming to meet the demand of diverse applications in terms of service flexibility and business adaptability. In this talk, we first report our current research progress, including a sliding window-based measurement framework, an automatic deployment policy, flexible data structures with dynamic sizes, heavy hitter and network delay detection approaches. Furthermore, we introduce a series of effective measurement tools such as stair sketches and periodic sketches. Finally, we summarize our talk and look to the future development.

Short Bio:

Guihai Chen is a distinguished professor of Nanjing University. He earned B.S. degree in computer software from Nanjing University in 1984, M.E. degree in computer applications from Southeast University in 1987, and Ph.D. degree in computer science from the University of Hong Kong in 1997. He had been invited as a visiting professor by Kyushu Institute of Technology in Japan, University of Queensland in Australia and Wayne State University in USA. He has a wide range of research interests with focus on parallel computing, wireless networks, data centers, peer-to-peer computing, high-performance computer architecture and data engineering. He has published more than 600 peer-reviewed papers, and most of them are in well-archived international journals such as over 80 ACM/IEEE Transactions papers, and also in well-known conference proceedings such as HPCA, MOBIHOC, MOBICOM, INFOCOM, ICNP, ICDCS, AAAI and NIPS. He has won 11 best paper awards including ICNP 2015 best paper award, DASFAA 2017 best paper award and IWQoS 2020 best paper award.



.Keynote Speech 3:

Title: Endogenous Intelligence Drives the Revolution of IoT

Time: 10:20-10:50 AM, November 4, 2022

Location: Main Conference Room: JIN GUI ROOM (金桂厅),

(Tencent Meeting ID: 793-733-086, PWD: 1104)



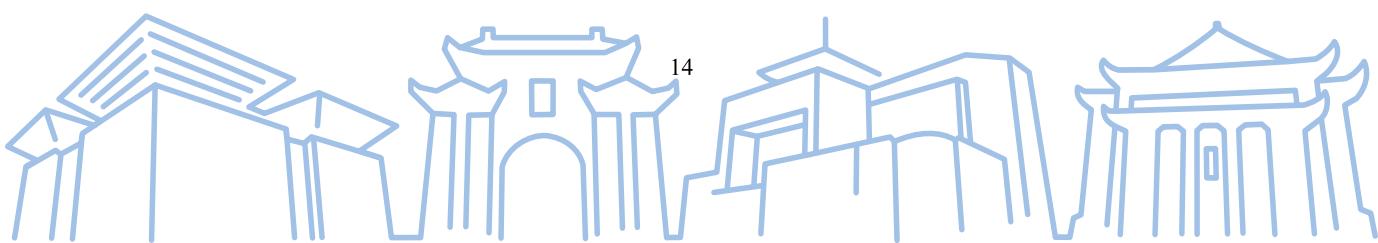
Prof. Huadong Ma
IEEE/CCF/CAAI Fellow
School of Computer Science
Beijing University of Posts and Telecommunications China

Abstract:

The rapid development of Artificial Intelligence (AI) brings many opportunities to Internet of Things (IoT). In this talk, we first introduce the long-term challenges of the development of IoT. Combing AI theory, we discuss some explorations and recent research progresses on intelligent sensing, intelligent transmission, and intelligent service in the IoT environment. In the future, endogenous intelligence will drive the revolution of IoT, we discuss the open issues on IoT area.

Short Bio:

Dr. Huadong Ma is a Professor of School of Computer Science, and Vice-Chair of Academic Committee, Beijing University of Posts and Telecommunications (BUPT), China. He is also Director of Beijing Key Lab of Intelligent Telecommunications Software and Multimedia, BUPT. He is Chief Scientist of the project “Basic Research on the Architecture of Internet of Things” supported by the National 973 Program of China from 2010 to 2013. He received his PhD degree in Computer Science from the Institute of Computing Technology, Chinese Academy of Science in 1995. His current research focuses on sensor networks and Internet of things, multimedia computing, and he has published over 400 papers in journals or Conferences and 5 books on these fields. As a co-author, he got the 2019 Prize Paper award of IEEE Transactions on Multimedia and the 2018 Best Paper Award from IEEE MultiMedia. He was awarded National Funds for Distinguished Young Scientists in 2009, the Natural Science Award of the Ministry of Education, China in 2017. He was/is an Editorial Board Member of the IEEE Transactions on Multimedia, IEEE Internet of Things Journal, and ACM Transactions on Internet of Things. He serves for Chair of ACM SIGMOBILE China, Director of CCF Technical Committee on IoT. He is IEEE/CCF/CAAI Fellow.



Keynote Speech4:

Title: Cyber-Physical-Social Systems

Time: 10:50-11:20 AM, November 4, 2022

Location: Main Conference Room: JIN GUI ROOM (金桂厅),

(Tencent Meeting ID: 793-733-086, PWD: 1104)



Prof. Laurence T. Yang

FCAE, FEIC, MAE, FIEEE, FIET

School of Computer Science and Technology

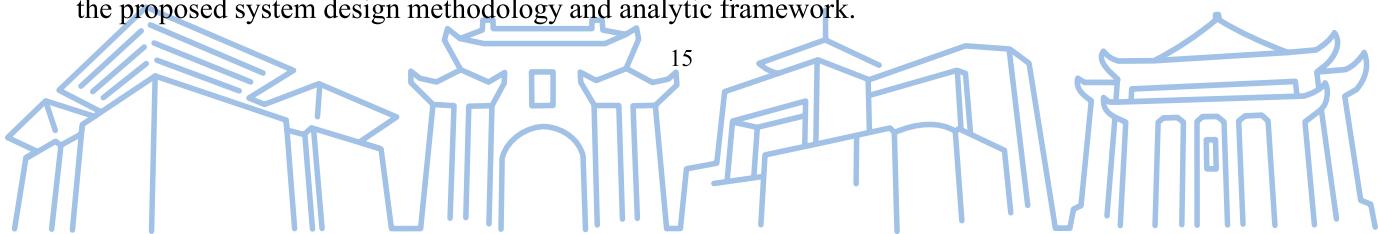
Hainan University, China

Abstract

The booming growth and rapid development in embedded systems, wireless communications, sensing techniques and emerging support for cloud computing and social networks have enabled researchers and practitioners to create a wide variety of Cyber-Physical-Social Systems (CPSS) that reason intelligently, act autonomously, and respond to the users' needs in a context and situation-aware manner. The CPSS are the integration of computation, communication and control with the physical world, human knowledge and sociocultural elements. It is a novel emerging computing paradigm and has attracted wide concerns from both industry and academia in recent years.

Currently, CPSS are still in their infancy stage. Our first ongoing research is to study effective and efficient approaches for CPSS modeling and general system design automation methods, as well as methods analyzing and/or improving their power and energy, security, trust and reliability features. Once the CPSS have been designed, they collect massive data (Volume) from the physical world by various physical perception devices (Variety) in structured/semi-structured/unstructured format and respond the users' requirements immediately (Velocity) and provide the proactive services (Veracity) for them in physical space or social space. These collected big data are normally high dimensional, redundant and noisy, and many beyond the processing capacity of the computer systems. Our second ongoing research is focused on the Big Data-as-a-Service framework, which includes data representation, dimensionality reduction, incremental and distributed processing, security and privacy, deep learning, clustering, prediction and proactive services, aiming at representing and processing big data generated from CPSS, providing more valued smart services for human and refining the previously designed CPSS.

This talk will present our latest research on these two directions. Corresponding case studies in some applications such as smart traffics will be shown to demonstrate the feasibility and flexibility of the proposed system design methodology and analytic framework.

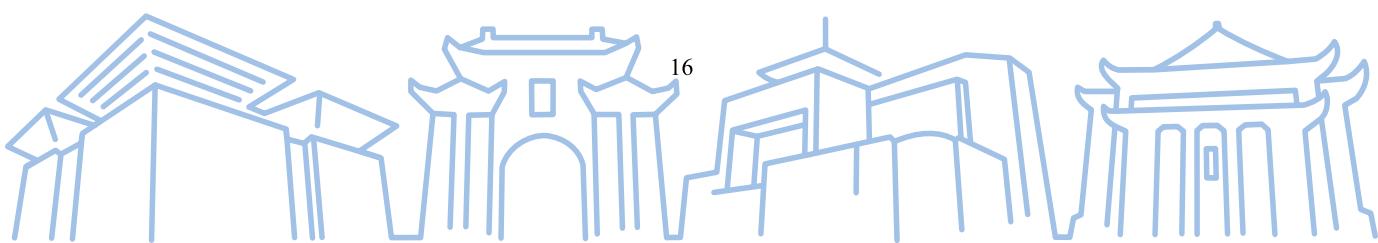


Short Bio:

Laurence T. Yang got his BE in Computer Science and Technology and BSc in Applied Physics both from Tsinghua University, China and Ph.D in Computer Science from University of Victoria, Canada. He is the Academic Vice-President and Dean of School of Computer Science and Technology of Hainan University, China. His research includes Cyber-Physical-Social System Design and Data Analytics. He has published 300+ papers in the above areas on top IEEE/ACM Transactions with total citations of 31231 and H-index of 89 including 8 and 40 papers as top 0.1% and top 1% highly-cited ESI papers, respectively.

He has been involved actively act as a steering chair for 10+ IEEE international conferences. He is the chair of IEEE CS Technical Committee of Scalable Computing (2008-2011, 2018-2021), the co-chair of IEEE SMC Technical Committee on Cybermatics (2016-), the co-chair of IEEE SC Hype-Intelligence Technical Committee (2021-), and the chair IEEE CIS Cyber-Physical-Social Systems Task Force (2019-) and the vice-chair of IEEE CIS Technical Committee on Smart World (2016-2019). In addition, he is serving as an editor for many international journals and is an author/co-author or an editor/co-editor of more than 25 books from well-known publishers, invited to give around 50 keynote talks at various international conferences and symposia.

He is a Fellow of Canadian Academy of Engineering (2017), Engineering Institute of Canada (2019), Institute of Electrical and Electronics Engineers (2020), and Institution of Engineering and Technology (2020), as well as a member of Academia Europaea, the Academy of Europe (2021), respectively. His recent honors and awards include the John B. Stirling Medal (2021) from Engineering Institute of Canada, IEEE Sensor Council Technical Achievement Award (2020), IEEE Canada C. C. Gotlieb Computer Medal (2020), ACM Distinguished Scientist (2020), Clarivate Analytics (Web of Science Group) Highly Cited Researcher (2019, 2020, 2022), etc.



Keynote Speech 5:

Title: Towards Human-centered AI with Endeavour to Understand Natural Languages

Time: 11:20-11:50 AM, November 4, 2022

Location: Main Conference Room: JIN GUI ROOM (金桂厅),

(Tencent Meeting ID: 793-733-086, PWD: 1104)



Prof. Xiaohui Tao

School of Mathematics, Physics and Computing

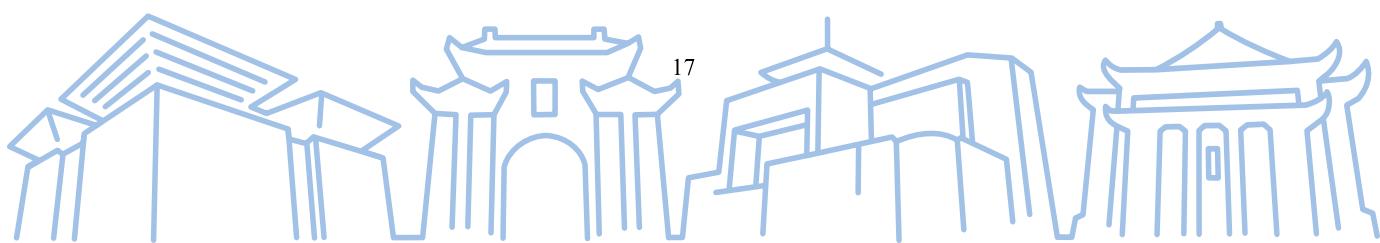
University of Southern Queensland, Australia

Abstract:

Artificial Intelligence (AI) and machine learning, alongside the advances in decision making, prediction, knowledge extraction, and logic reasoning are widely implemented to address challenges in diverse areas, for example, machine translation, sentiment analysis and opinion mining, social justice and social good, etc. In this talk, we will present and discuss our recent endeavour to enhance the understanding of human natural language and the adoption of the understanding to deliver human-centered services to the community. These typical works reflect our current endeavour on human-centered AI - AI by humanity, for humanity and in service to humanity.

Short Bio:

Dr. Xiaohui Tao is full Professor and Lead of Computing Discipline in the School of Mathematics, Physics and Computing at the University of Southern Queensland, Australia. He is a Senior Member of IEEE and ACM, and an active researcher in AI. Dr. Tao received his Ph.D. in Information Technology from Queensland University of Technology, Australia, which has led to research in data analytics, machine learning, knowledge engineering, natural language processing, and health informatics. His research outcomes have been published in 150+ papers across many top-tier journals (e.g., TKDE, INFFUS, IPM, etc.) and conferences (e.g., IJCAI, ICDE, CIKM, etc). Tao is the recipient of an Australia Research Council Grant, an Australian Endeavour Research Fellowship, along with several other awards from respected professional bodies and organisations. Tao is Editor-in-Chief of Natural Language Processing Journal, Elsevier. Currently, he is leading a research group that develops algorithms and systems with real-world impact.



Keynote Speech 6:

Title: Mobile Crowdsensing in Instant Delivery

Time: 14:00-15:30 PM, November 4, 2022

Location: Main Conference Room: JIN GUI ROOM (金桂厅),

(Tencent Meeting ID: 793-733-086, PWD: 1104)



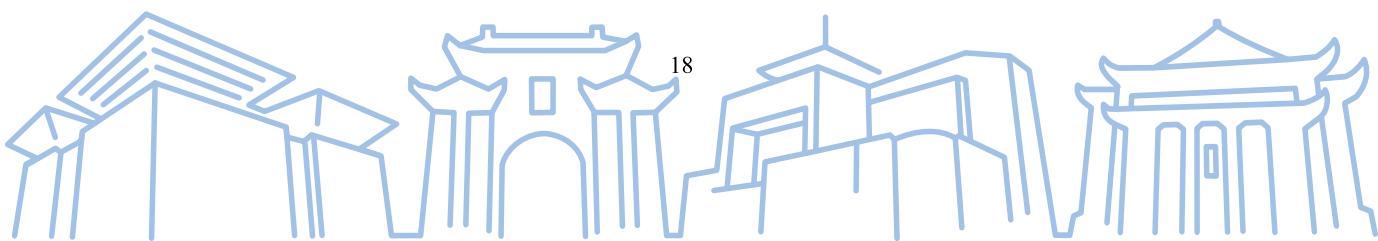
Prof. Yunhuai Liu
School of Computer Science
Peking University, China

Abstract:

With the rapid development of mobile Internet and O2O businesses, new service models based on instant delivery are becoming increasingly popular, which enables many new applications such as instant takeaway delivery, supermarket fresh express[26], and city express. In 2017, mainland China has over 10 billion instant delivery orders with a 314% year-on-year increase, accounting for 25% of the logistic volume. With these O2O business, many new human mobility data can be collected in a non-intrusive manner with extremely low cost. In this talk, we will introduce our recent collaboration works with a major instant delivery service provider, showing many new opportunities and unique challenges in this new service model. We will show how to exploits the crowdsensing techniques to solve the emerging problems and point out some future work directions.

Short Bio :

Dr. Yunhuai Liu is now a professor with Peking University, P.R. China. He received his B.E in Computer Science from Tsinghua University, and PhD degree in Computer Science and Engineering from Hong Kong University of Science and Technology in 2008. In the year 2010, he joined Shenzhen Institutes of Advanced Technology, Chinese Academy of Sciences. From 2011 to 2016, he was with the Third Research Institute of Ministry of Public Security, China. He is the receipt of National Distinguish Young Scientists Foundation, and National Talented Young Scholar program. He received the third-class personal medal of Ministry of Public Security. He is now serves as the Vice chair of ACM China Council, and served as the Associate Editor for IEEE TPDS , IEEE TNSE, and TPC members of ACM Sensys, IEEE INFOCOM and etc. He received the Outstanding Paper Award at the 2008 the 28th IEEE ICDCS, and 2018 the 25th SANER. He has published over 100 peer-reviewed technical papers with over 4800 citations (google scholar).



Keynote Speech 7:

Title: Congestion Management in Datacenter Networks: Status Quo and Opportunities

Time: 14:00-15:30 PM, November 4, 2022

Location: Main Conference Room: JIN GUI ROOM (金桂厅),

(Tencent Meeting ID: 793-733-086, PWD: 1104)



Prof. Chen Tian

State Key Laboratory for Novel Software Technology

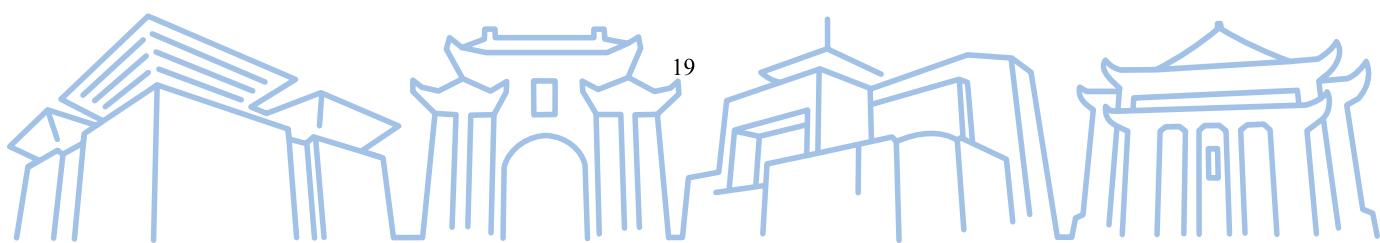
Nanjing University, China

Abstract:

Congestion management, including congestion control and flow control, plays a critical role in the performance of datacenter networks. Due to the growth of port bandwidth and the scale of data center applications, new opportunities appear in this classic research area. A large number of researches are published recently. In this talk, I will first review the status quo in recent 5 years. Then I will present our progress in this field, together with possible future directions.

Short Bio:

Chen Tian is a professor at State Key Laboratory for Novel Software Technology, Nanjing University, China. He has published a number of publications in top-tier conferences, including 6 SIGCOMM, 2 NSDI, 1 FAST, and 1 sigmod. He was the only winner of "Best Cooperative Professor of year 2020" awarded by Huawei Central Research Institute.



Keynote Speech 8:

Title: Software Stack for Serverless Computing

Time: 14:00-15:30 PM, November 4, 2022

Location: Main Conference Room: JIN GUI ROOM (金桂厅),

(Tencent Meeting ID: 793-733-086, PWD: 1104)



Prof. Keqiu Li

IEEE Fellow

College of Intelligence and Computing

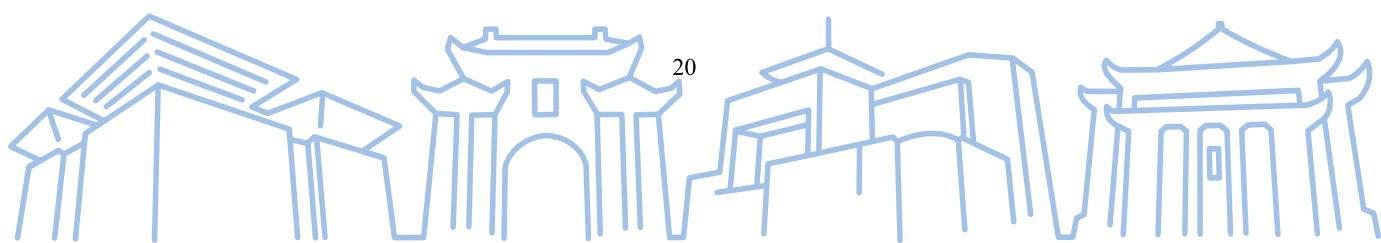
Tianjin University, China

Abstract:

Due to its resource management-free, auto-scaling and cost efficiency advantages, serverless computing has been a success in multiple areas, e.g., web services, IoT monitoring applications, entertainment. In order to ensure the performance of small-sized and short-lived function applications, the serverless software stack has to be carefully designed. In this report, we will discuss the current research on serverless computing system software and discuss technique trends.

Short Bio:

Keqiu Li is a professor at the College of Intelligence and Computing, Tianjin University, China. His research areas include mobile computing, block chain, and cloud computing. He is an IEEE Fellow.



ACM SIGCOMM China Young Scholars Forum

SPEECH 1

Dr. Yuanjie Li,
Tsinghua University



Title: A Case for Stateless Mobile Core Network Functions in Space

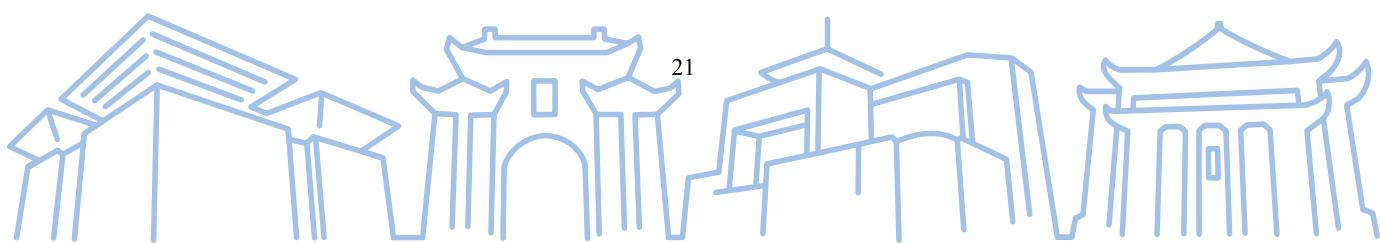
Time: 16:10-17:25 PM, November 4, 2022

Location: JIN GUI ROOM (金桂厅) (Tencent Meeting ID: 793-733-086, PWD: 1104)

ABSTRACT: Mobile networks (5G and beyond) have successfully served billions of users. But their expensive deployment and operation costs in rural areas, developing countries, aircraft, or oceans limit them from covering the remaining 3.7 billion “unconnected” global users. Their terrestrial infrastructure is also vulnerable to disasters (earthquakes, tornados, or wars). This talk explores the feasibility of pushing mobile network functions to low-earth-orbit (LEO) satellite mega-constellations. While this paradigm promises to solve the above issues and is being actively tested, it challenges various basic assumptions of terrestrial mobile networks and raises scalability, performance, and security concerns. A major challenge is today’s stateful mobile core, which suffers from signaling storms in satellites’ extreme mobility, intermittent failures in outer space, and attacks when unavoidably exposed to untrusted foreign locations. To this end, we make a case for a stateless mobile core in space. Our proposal, SpaceCore, decouples states from orbital core functions, simplifies location states via geospatial addressing, eliminates unnecessary state migrations in satellite mobility by shifting to geospatial service areas, and localizes state retrievals with device-as-the-repository. We last discuss some issues and potential directions toward mobile networks in the space era.

Short Bio:

Yuanjie Li is an assistant professor at Institute for Network Sciences and Cyberspace at Tsinghua University. He was a researcher at Hewlett Packard Labs from 2018 to 2020 and the co-founder of MobiIQ Technologies from 2017 to 2018. He received his Ph.D. in Computer Science from UCLA in 2017 and B.E. in Electronic Engineering from Tsinghua University in 2012. His research interests are network systems and security, with a recent focus on mobile networking, intelligent wireless edge, and Internet-of-Things (IoT). He is a recipient of the ACM SIGCOMM China Rising Star Award in 2022, ACM MobiCom'17 Best Community Paper Award, and MobiCom'16 Best Community Paper Award. His work has resulted in an open-source community tool (MobileInsight), which has been used by 300+ universities and companies since its release in 2016.



SPEECH 2

Prof. Zehua Guo

Beijing Institute of Technology



Title: Smart Traffic Engineering

Time: 16:10-17:25 PM, November 4, 2022

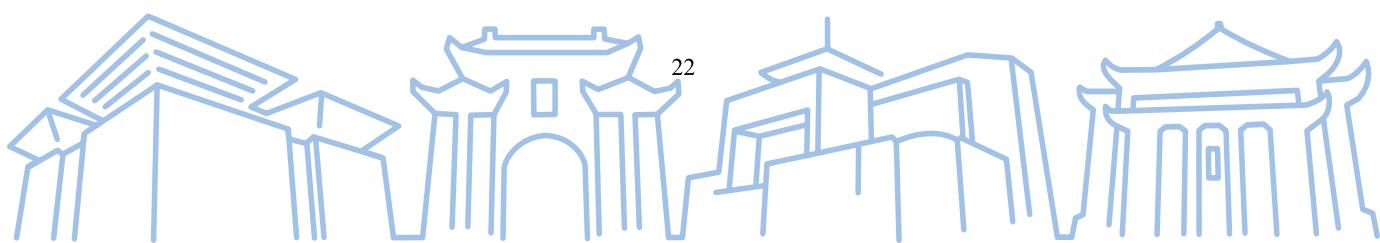
Location: JIN GUI ROOM (金桂厅) (Tencent Meeting ID:
793-733-086, PWD: 1104)

ABSTRACT:

Traffic engineering is the core function of the network. It configures the forwarding paths of traffic in the network to balance the load on the link and minimize the possibility of network congestion, which helps service providers optimize network performance and improve resource utilization. This talk focuses on smart traffic engineering solutions, which combine machine learning algorithms and linear programming to optimize link load balancing performance while reducing network disturbance.

Short Bio:

Zehua Guo is a professor and Ph.D. supervisor at the Beijing Institute of Technology. He is a senior member of IEEE, China Computer Federation, China Institute of Electronics, and China Institute of Communications and a member of ACM. He was a Research Fellow at New York University Tandon School of Engineering and a Postdoctoral Research Associate at the University of Minnesota Twin Cities. His research interests include programmable networks, machine learning, and network security. He received the 2021 ACM SIGCOMM China Rising Star Award. He has published 85 papers in top journals and conferences, such as TON, JSAC, TMC, and IJCAI, including 37 CCF A/B papers, and owned 12 patents. He is an associate editor of IEEE Systems Journal and 4 SCI-index journals, and the TPC of AAAI, IWQoS, and 13 international conferences.



SPEECH 3

Dr. Tuo Shi

Harbin Institute of Technology



Title: The Service Management and Task Processing in the Edge Computing

Time: 16:10-17:25 PM, November 4, 2022

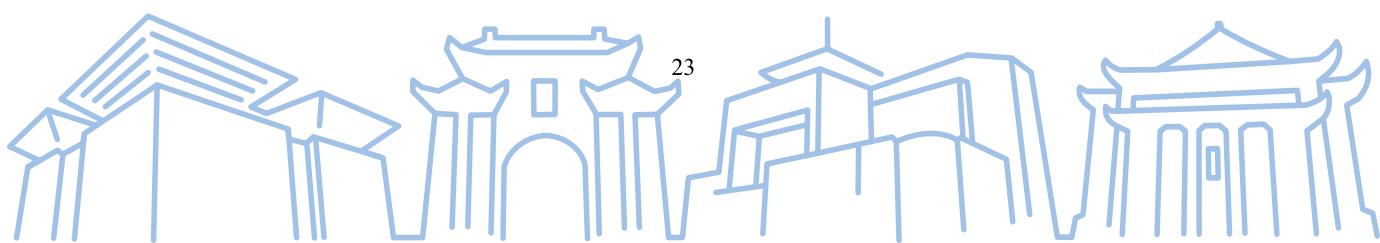
Location: JIN GUI ROOM (金桂厅) (Tencent Meeting ID: 793-733-086, PWD: 1104)

ABSTRACT:

Edge computing is an emerging computing architecture in the IoT. Edge computing can push the computing, storage, and communication resources from the remote cloud to the network edge and provide efficient services to IoT users. However, the increasing amount of IoT users and the complex services arouse new challenges. First, due to the limited network resources, it is difficult to provide high-quality services for IoT users. Second, the large volume of users' requests dramatically increases the workload of edge servers, and thus, how to process edge tasks effectively and energy efficiency still remains a problem. In order to solve these two challenges, we first analyze the theoretical relationship between the edge task, the latency, and the energy consumption. Furthermore, we also investigate these two problems from service management and task processing.

Short Bio:

Tuo Shi received his BS and Ph.D. degrees in computer science from Harbin Institute of Technology, China. He is currently a Research Associate in the College of Intelligence and Computing at Tianjin University. His research interests include sensor networks, battery-free networks, and mobile edge computing. He has published papers in refereed journals and conferences, including IEEE/ACM Transactions on Networking (TNET), IEEE Transactions on Mobile Computing (TMC), INFOCOM, and ICDCS. He is also the reviewer of distinguished journals, including TWC, IoT-J, TKDE, and JCST, and TPC members of SECON and WASA.



SPEECH 4

Dr. Xiuzhen Guo

Tsinghua University



Title: Research on Heterogeneous Connection for Internet of Things

Time: 16:10-17:25 PM, November 4, 2022

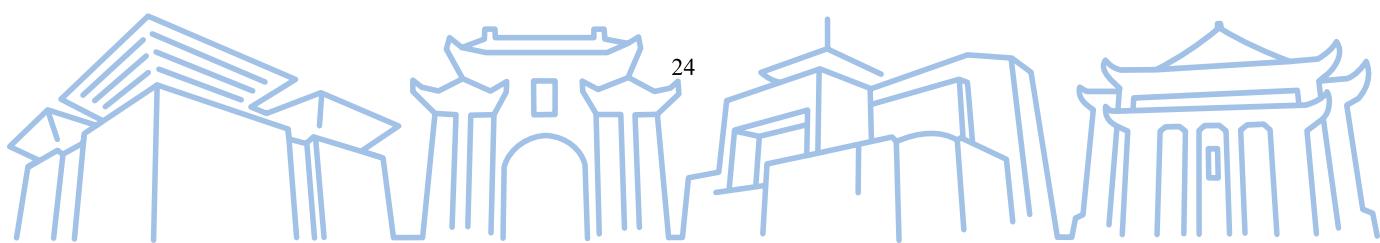
Location: JIN GUI ROOM (金桂厅) (Tencent Meeting ID: 793-733-086, PWD: 1104)

ABSTRACT:

The ever-developing Internet of Things (IoT) brings the prosperity of wireless sensing and control application. In many scenarios, different wireless technologies coexist in the shared frequency medium as well as the physical space. Such wireless coexistence may lead to serious Cross Technology Interference (CTI) problems, e.g. channel competition, signal collision, throughput degradation. Compared with traditional methods like interference avoidance, tolerance and concurrency mechanism, directly and timely information exchange among heterogeneous devices is therefore a fundamental requirement to ensure the usability, inter-operability and reliability of the IoT. Under this circumstance, Cross Technology Communication (CTC) technique thus becomes a hot topic in both academic and industrial field, which aims at directly exchanging data among heterogeneous devices that follow different standards. I will introduce our research on heterogeneous connection for Internet of Things.

Short Bio:

Xiuzhen Guo is a research assistant/postdoc in the School of Software and BNRIst of Tsinghua University. She received her B.E. degree in Southwest University, and her PhD degree in Tsinghua University. She received the ACM China Doctoral Dissertation Award and Shuimu Tsinghua Scholar. Her research interests include wireless networks and Internet of Things. She has published 30 papers in NSDI, MobiCom, TON, INFOCOM, SenSys, IPSN, TOSN, etc. She served as the submission chair of IEEE SECON 2022, the co-publicity chair of IEEE ICPADS 2022, and the TPC member of IEEE MASS, IEEE ICPADS, IEEE DCOSS, ACM EWSN, EAI MobiQuitous.



SPEECH 5

Dr. Yi Zhao

Tsinghua University



Title: Collaboration-Enabled Intelligent Internet Architecture

Time: 16:10-17:25 PM, November 4, 2022

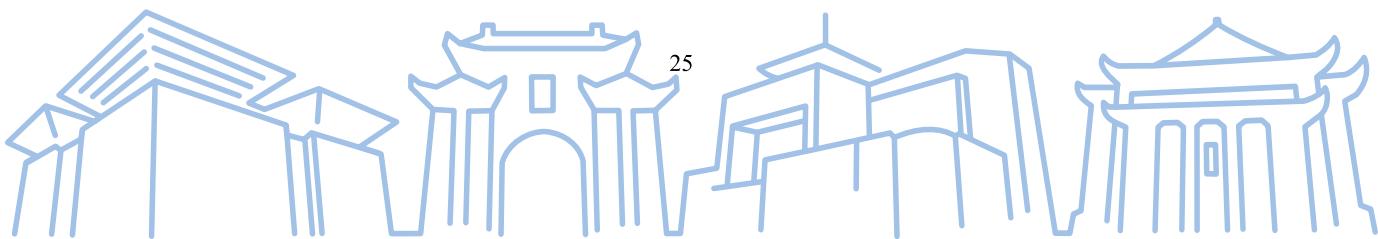
Location: JIN GUI ROOM (金桂厅) (Tencent Meeting ID:
793-733-086, PWD: 1104)

ABSTRACT:

Since intelligent algorithms such as deep learning (DL) have strong expressiveness, flexibility, and scalability for complex problems, some DL-based methods have been applied to Internet architecture-related scenarios, such as congestion control and malicious traffic detection. However, DL-based models have relatively high requirements for resources such as data and computing, and the existing Internet architecture requires further evolution to break through these limitations. Therefore, we propose the collaboration-enabled intelligent Internet architecture, which can leverage intelligence to facilitate the evolution of Internet architecture in more complex scenarios. Specifically, we first discuss the inherent opportunities and challenges of enabling the Internet architecture to be intelligent through collaboration, which are brought by the imbalance of Internet supply and demand, distributed organizational structure, and the lack of built-in security. Immediately after, we present the newly proposed collaboration-enabled intelligent Internet architecture, which consists of heterogeneous hardware infrastructure and a collaboration-oriented software service platform. Through the complementarity of these two components (i.e., providing hierarchical computing and full exploitation of hierarchical capabilities), it promotes the collaboration of intelligent algorithms built into the Internet architecture. Moreover, some flexible algorithmic modules for the proprietary requirements of the Internet architecture are built into the software service platform.

Short Bio:

Dr. Yi Zhao received the B. Eng. degree from the School of Software and Microelectronics, Northwestern Polytechnical University, Xi'an, China, in 2016, and the Ph.D. degree from the Department of Computer Science and Technology, Tsinghua University, Beijing, China, in 2021. Currently, he is an assistant researcher and postdoctoral fellow at the Department of Computer Science and Technology, Tsinghua University. He is a recipient of the Shuimu Tsinghua Scholar Program, and is awarded the fellowship of China National Postdoctoral Program for Innovative Talents. His research interests include next-generation Internet, network security, AI security and network economics.



Sessions

Session 1: Cloud Computing and Applications I

Room: GUI HU ROOM(桂湖厅)/ Tencent Meeting ID: 498-581-350, PWD:110501

Time: 08:30-10:00, November 5, 2022

Chair: Associate Professor Peng Liu

ColorByte: A real time MOT method using fast appearance feature based on ByteTrack

Lin Shen, Mengyang Liu, Caishan Weng, Jinghui Zhang, Fang Dong and Fa Zheng

TCN-based Lightweight Log Anomaly Detection in Cloud-edge Collaborative Environment

Jining Chen, Weitu Chong, Siyu Yu, Zhun Xu, Chaohong Tan and Ningjiang Chen

Research on Cloud Computing load forecasting based on LSTM-ARIMA combined model

Xiaomin Liu, Xiaolan Xie and Qiang Guo

Long-Term Workload Forecasting in Grid Cloud using Deep Ensemble Model

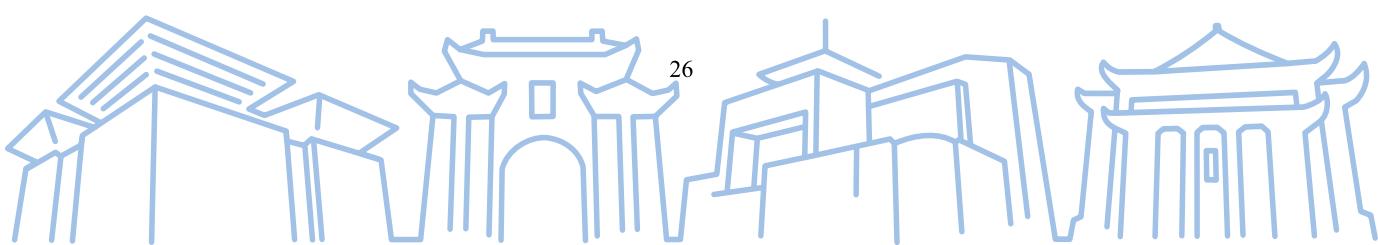
Jiaang Bao, Chao Yang, Nu Xia and Dian Shen

Collective Spatial Keyword Query on Time Dependent Road Networks

Jingtao Xue, Chunyu Wu, Bin Zhao and Ying Hu

CUDA Acceleration of Worst-Case Execution Time Analysis Based On Model Checking

Wanxin Shang, Tao Wu, Fei Yang, Xi Chen, Jingjue Chen and ZhenXia Yu



Session 2: Cloud Computing and Applications II

Room: RONG HU ROOM(榕湖厅)/Tencent Meeting ID: 724-843-890, PWD:110502

Time: 08:30-10:00, November 5, 2022

Chair: Professor Bineng Zhong

Reservoir: Enhance the Burst-flow Tolerance in Datacenter Networks

Jiaren Yu, Shan Huang, Guoyuan Yuan and Dezun Dong

DNN Training Optimization with Pipelined Parallel Based on Feature Maps Encoding

Lijuan Shen, Yingchi Mao, Zibo Wang, Hua Nie and Jianxin Huang

Policy-Based Access Control System for Delta Lake

Zhe Chen, Hangyu Shao, Yuping Li, Hongru Lu and Jiahui Jin

A Spark-Based Parallel Implementation of Compressed Hyperspectral Image Reconstruction and Anomaly Detection

Qiliang Zhu, Yaoqin Zhu, Jin Sun and Zebin Wu

DASH+: Download Multiple Video Segments with Stream Multiplexing of QUIC

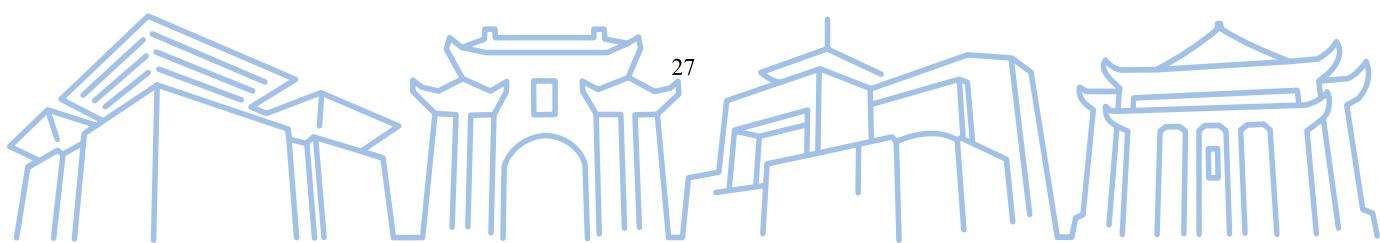
Changjiang Cui, Yifei Lu, Shuren Li, Jingqi Li and Zeqi Ruan

ASCFL: Adaptive Client Clustering for accurate and fast convergence Federated Learning

Jingyi He, Biyao Gong, Jiadi Yang, Hai Wang, Pengfei Xu and Tianzhang Xing

Multi-Layer Efficient Data Classification Methods for Enterprise Business Applications

Yazeed Alzahrani, Jun Shen and Jun Yan



Session 3: Machine Learning & Data Mining I

Room: SHAN HU ROOM(杉湖厅)/Tencent Meeting ID: 925-844-468, PWD:110503

Time: 08:30-10:00, November 5, 2022

Chair: Associate Professor Huimin Zhang

Unsupervised Semantic Segmentation with Feature Enhancement for Few-shot Image Classification

Xiang Li, Zhuoming Xu, Qi Xu and Yan Tang

DC3D: A Video Action Recognition Network Based on Dense Connection

Xiaofang Mu, Zhenyu Liu, Jiaji Liu, Hao Li, Yue Li and Yikun Li

A Customized Protocol Cluster Analysis Method based on Reinforcement Learning

Peiyong Wu, Xiaohui Li and Junfeng Wang

A Batching Method for Complex Emitters Based on Frequency Agility Pattern Mining

Tian Tian, Jianchao Jia, Ran Jia and Shenggang Yan

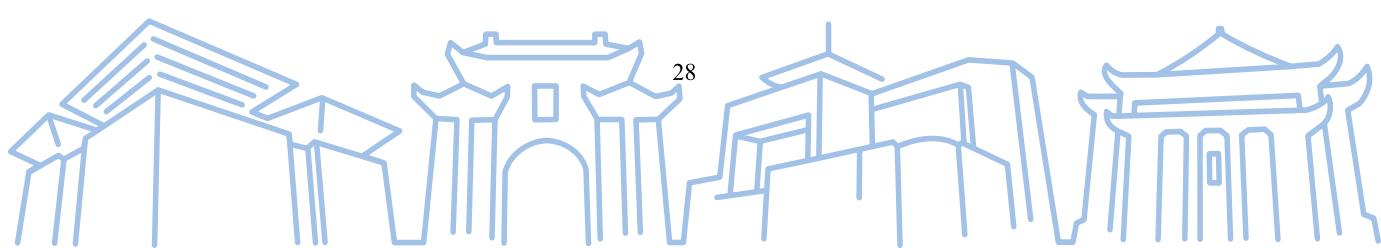
A Novel RNN Model with Enhanced Behavior Semantic for Network User Profile

Ming Li, Xingwang Han, Hua Sheng, Lin Ma, Hanzhang Kang, Weite Liu and Bo Mao

TeCNTS: A Robust Collaborative Filtering Recommendation Scheme Based on Time-effective Close

Neighbor Trusted Selection Strategy

Zhilong Han, Yuanzhe Fan, Geng Chen and Ting Zhou



Session 4: Machine Learning & Data Mining II

Room: GUI HU ROOM(桂湖厅)/ Tencent Meeting ID: 498-581-350, PWD:110501

Time: 10:20-11:50, November 5, 2022

Chair: Professor Canlong Zhang

Efficient and Effective Expert Finding based on Community Search: A Demonstration

Chengyu Du, Xiaoxuan Gou, Yuxiang Wang and Xiaoliang Xu

Weighted Fuzzy Clustering Algorithm Based on Max-Min Distance Criterion and Jeffrey Divergence

Hailan Wang, Xiaolan Xie, Jili Chen and Yarong Liu

Label Enhancement with Sample Correlation via Sparse Representation

Xiaoqian Zeng, Qin Qin, Chao Tan, and Genlin Ji

Learning Inter-Frame Information for Space-Time Video Super-Resolution

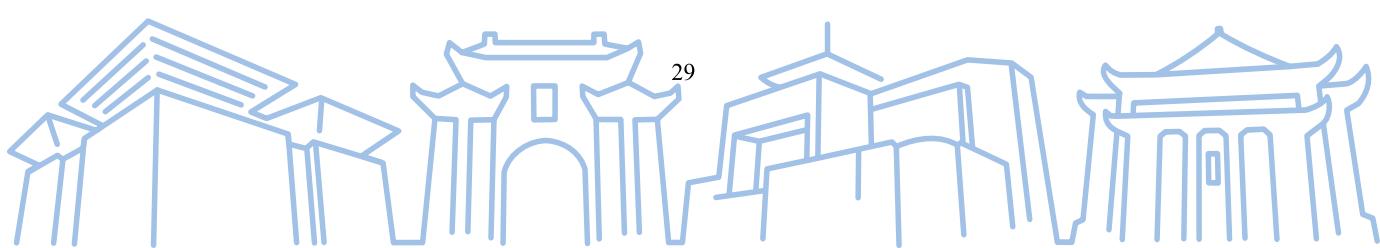
Zhuo Zhang, Haifu Guo, Sheng Ren and Kehua Guo

Text classification based on machine learning for Tibetan social network

Hui Lv, Fenfang Li, Yatao Liang, La Duo, Jun Shen, Yan Li and Qingguo Zhou

OEIS: Knowledge Graph based Intelligent Search System in Ocean Engineering

Rui Zhu, Xiaoqing Wu, Yanna Hu, Yize Chen and Bo Liu



Session 5: Machine Learning & Data Mining III

Room: RONG HU ROOM(榕湖厅)/Tencent Meeting ID: 724-843-890, PWD:110502

Time: 10:20-11:50, November 5, 2022

Chair: Associate Professor Guangquan Lu

Device-free Crowd Density Estimation with Off-the-shelf WiFi Traffic

Jianwei Liu, Guozheng Yang, Cheng Zang, Jiajun Chen, Xianming Hu, Jingzhi Zhang, Yinghui He, Jinsong Han and Kui Ren

A Semantic Segmentation Method for High-resolution Remote Sensing Images Based on Encoder-Decoder

Jingyu Yang, Liang Zhao, Jianwu Dang, Yangping Wang, Biao Yue and Zongliang Gu

Detecting Key Offenders from Crime Incidents via Attributed Heterogeneous Network Learning

Zhe Li, Xiao Jing, Shanshan Cao, Tianfan Zhang and Zhiang Wu

Wb-MSF: A Large-scale Multi-source Information Diffusion Dataset for Social Information Diffusion Prediction

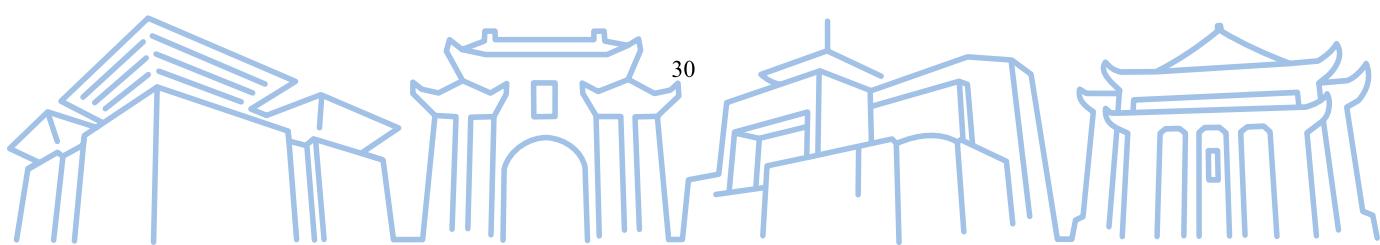
Zhen Wu, Jingya Zhou, Jie Wang and Xigang Sun

Personalized tourism recommendation algorithm integrating tag and emotional polarity analysis

Peng Yuan, Qiuxia Chen, Zhifeng Wang and Jinfeng Yang

A Personalized Scenic Spot Recommendation Algorithm Based on Improved TrustSVD Model

Yuqun Wu, Yongzhong Li and Bo Xu



Session 6: Cloud Security and Privacy I

Room: SHAN HU ROOM(杉湖厅)/Tencent Meeting ID: 925-844-468, PWD:110503

Time: 10:20-11:50, November 5, 2022

Chair: Professor Zhi Li

A Fuzzy Multi-Identity Based Signature

Yaqiong Guo, Peng Zhou, Xin Lu, Wangshu Sun and Jiasai Sun

Semantic Integration based User Behavior Monitoring Framework in Zero Trust Network

Yansheng Qu, Hua Huang, Lin Chen, Lina Zhao, Yuxiang Zhao, Jie Zhang and Bo Mao

Decentralized Blockchain Network

Tamara Abdulmunim Abduljabbar, Xiaohui Tao, Ji Zhang, Jianming Yong and Xujuan Zhou

The Threat of Distributed Denial-of-Service Attack for User Equipment in 5G Networks

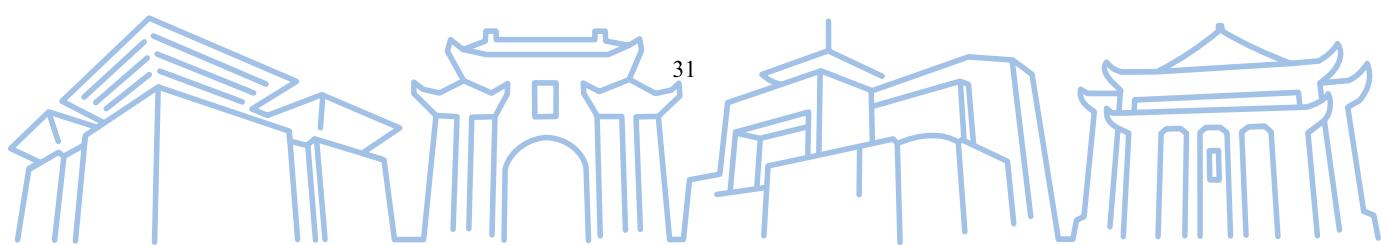
Danish Khan, Xujuan Zhou and Jianming Yong

Space-efficient logging for Supply Chain Traceability based on blockchain

Shuang Qiao, Chenhong Cao, Haoquan Zhou and Wei Gong

A Solution Supporting Secure Transmission of Big Data

Haonan Ling, Yan Gao, Huibin Wang and Ming Chen



Session 7: Cloud Security and Privacy II

Room: GUI HU ROOM(桂湖厅)/ Tencent Meeting ID: 498-581-350, PWD:110501

Time: 14:00-15:30, November 5, 2022

Chair: Professor Li-e Wang

Efficient Online and Privacy-preserving Medical Pre-diagnosis Based on Growing Learning Vector Quantization

Xiao Zheng, Qiuyue Zhang, Xuan Tang, Xiujun Wang and Chunlai Du

Realizing Power-efficient Encryption Communication for Computational RFID Tags

Yihang Song, Li Lu, Jiqing Gu and Chong Zhang

A Hybrid Attack Graph Analysis Method based on Model Checking

Yaogang Ge, Xiaomeng Shen, Bingfeng Xu and Gaofeng He

Analysis Method of Security Critical Components of Industrial Cyber Physical System based on SysML

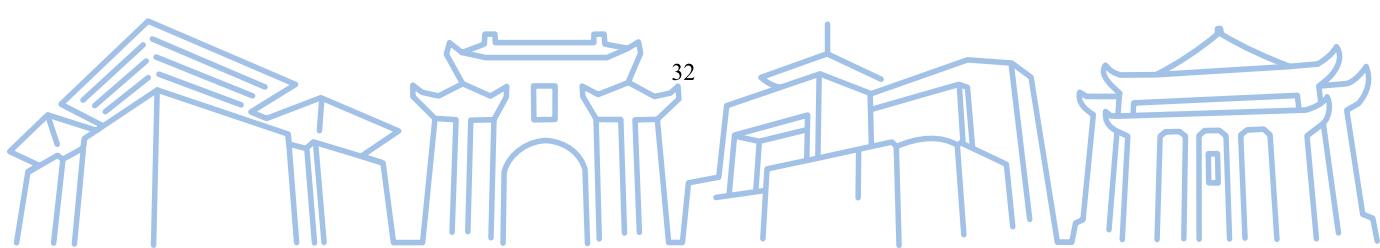
Junjie Zhao, Bingfeng Xu, Xinkai Chen, Bo Wang and Gaofeng He

The Application of RNN-based API Data Security Detection in Government Cloud Service

Jing Wen, Chaohong Tan, Jining Chen, Qin Zhao, Sen Li and Fei Zhou

WMLink: Wearable Smart Devices and Mobile Phones Linking through Passive Sniffing BLE and WiFi Signals

Naixuan Guo, Zhaofeng Chen, Heyang Xu, Zhechun Zhao, Yu Liu and Sen Xu



Session 8: Edge Computing & Miscellaneous

Room: RONG HU ROOM(榕湖厅)/Tencent Meeting ID: 724-843-890, PWD:110502

Time: 14:00-15:30, November 5, 2022

Chair: Lecturer Tong Yi

IoTPass: IoT Data Management System for Processing Time-series Data

Zehua Nie, Can Su, Yichen Mao and Kaigui Bian

A Kubernetes-Oriented Edge Network Orchestrator for Heterogeneous Environment

Chenyu Lu, Zhaowu Huang, Caishan Weng, Feng Jiao, Xiaolin Guo and Fang Dong

Autoencoder-based OFDM for Agricultural Image Transmission

Dongbo Li, Xiangyu Liu, Yuxuan Shao, Yuchen Sun, Siyao Cheng and Jie Liu

Deep Reinforcement Learning for Task Scheduling in Intelligent Building Edge Network

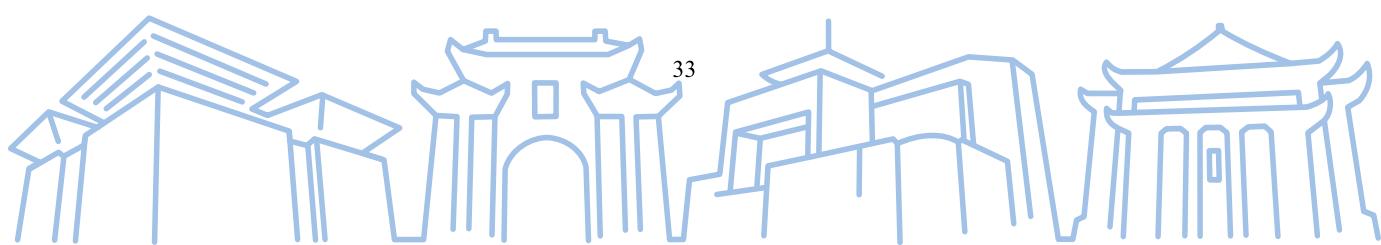
Yuhao Chen, Zhe Zhang, Huixue Wang, Yunzhe Wang, Qiming Fu and You Lu

A Novel Firewalls Configure Fault and Its Repair Method

Penghui Su, Yan Gao and Ming Chen

Scheme of Peer-to-Peer Trade in Multi-Microgrid Based on Blockchain

Guanjun Zhao, Lizhong Jia, Jie Xu, Chang Liu, Weijun Hu and Chunpei Li



Session 9: Graph Learning & Miscellaneous

Room: SHAN HU ROOM(杉湖厅)/Tencent Meeting ID: 925-844-468, PWD:110503,

Time: 14:00-15:30, November 5, 2022

Chair: Professor Jinyan Wang

Virtual Network Embedding with Virtual Nodes Ranking and Multi Points Sampling

Ying Yuan, Yichen Yang and Cong Wang

A Knowledge Graph-based Interactive Recommender System Using Reinforcement Learning

Ruoxi Sun, Jun Yan and Fenghui Ren

PEACE: Towards Optimizing Monitoring Utility of Unmanned Aerial Vehicles with Adverse Effect Constraints

Jingwu Wang, Weijun Wang, Haipeng Dai, Lanlan Li and Guihai Chen

Request-Aware Task Offloading in Mobile Edge Computing via Deep Reinforcement Learning

Ziwen Sheng, Yingchi Mao, Jiajun Wang, Hua Nie and Jianxin Huang

A Multivariate Time Series Anomaly Detection Model Based on Graph Attention Mechanism in Energy Consumption of Intelligent Buildings

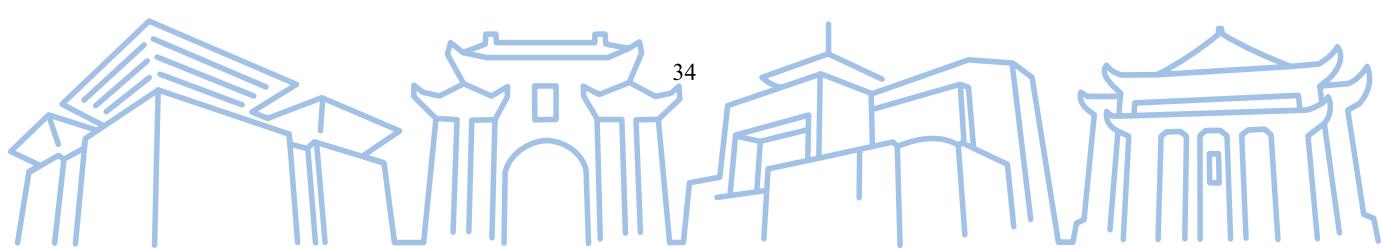
Zhe Zhang, Yuhao Chen, Huixue Wang, Yunzhe Wang, Qiming Fu and You Lu

Attentional Meta-path Contrastive Graph Convolutional Networks for Knowledge Concept Recommendation

Weiwei Wang, Liting Wei, Yun Li, Yi Zhu, Bin Li and Lejun Zhang

A Staging Prediction Model for COVID-19 Pandemic Under Strong Public Health Interventions

Qian Huang, Jie Ma, Zhou Xu, Xiaodan Gu and Ming Yang



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