CONFERENCE PROGRAM

May 13-15, 2022 | Virtual Conference

CCF 15th International Conference on
SERVICE SCIENCE

THEME

Regulation and Governance of Digital Services

Host

中国计算机学会
CCF

Organizers

中国计算机学会
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中山大学
SUN YAT-SEN UNIVERSITY

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Changjun Jiang, Professor, Tongji University, China

Hai Jin, Professor, Huazhong University of Science and Technology, China

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- DEVICE TEST ON MAY 13 -

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China Standard Time (CST) UTC/GMT+08:00

All the speakers/presenters/session chairs are suggested to attend the test sessions based on the time table above; you can enter the room at your appropriate local time between 10:00-17:00 (CST), May 13, 2022.

ZOOM ID: 870 2542 0666 (Room 1)

10:00-12:00
14:00-18:00

Keynote Speakers & Panels

ZOOM ID: 859 8085 1580 (Room 2)

10:00-12:00
14:00-18:00

Invited Sessions & Paper Sessions

- NAMING MANNER -

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Please Rename by Entering the Meeting Room

Role	Format	Example
Session Chair	Session Number-SC-Name	S1-SC-Abby
Presenter	Session Number-Paper ID-Name	S1-IP001-Alex
Listener	Listener-Name	Listener-Aron

- AGENDA ON MAY 14 -

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Zoom ID: 870 2542 0666 (Room 1)

Opening Ceremony

Chair: Jiajing Wu, Sun Yat-sen University

08:40-09:10	**Jianwei Yin**, Zhejiang University, China; **Junbin Fang**, Jinan University, China **Zibin Zheng**, Sun Yat-sen University, China; **Dan Li**, Sun Yat-sen University, China

Group Photo | 09:10-09:15

Keynote Speeches

Chair: Zhiyong Feng, Tianjin University

09:15-09:55   **New Forms and Challenges of Services in Metaverse Ecosystems**
Xiaofei Xu, Harbin Institute of Technology

Chair: Zhongjie Wang, Harbin Institute of Technology

09:55-10:35   **Testing Service-Oriented Software without Precise Test Oracles**
Shing-Chi Cheung, The Hong Kong University of Science and Technology

Break | 10:35-10:45

Parallel Sessions

10:45-12:00   Click the Session Title to Access the Details

Zoom ID: 870 2542 0666 (Room 1)	Zoom ID: 859 8085 1580 (Room 2)	Zoom ID: 834 9183 6227 (Room 3)	Zoom ID: 880 0896 9731 (Room 4)
Invited Session 1	**Invited Session 2**	**Paper Session 1**	**Paper Session 2**
Research on Service Ecosystem and Its Evolution	Blockchain Technology and Applications	Service Scheduling and Management	Service Recommendation and Prediction

Lunch | 12:00-13:30

13:30-17:00   Click the Session Title to Access the Details

Zoom ID: 870 2542 0666 (Room 1)	Zoom ID: 859 8085 1580 (Room 2)	Zoom ID: 834 9183 6227 (Room 3)	Zoom ID: 880 0896 9731 (Room 4)
Panel 1	**Panel 2**	**Panel 3**	**Panel 4**
Blockchain and Digital Economy	Regulation and Governance of Digital Services	Computing Force Network (13:30-17:25)	Sino-Australia Advanced Technology of Service Computing

- AGENDA ON MAY 15 -

Zoom ID: 870 2542 0666 (Room 1)

Keynote Speeches

Chair: Bing Li, Wuhan University

09:00-09:40

Cloud Intelligence / AIOps: Infusing AI/ML into Cloud Computing Systems

Qingwei Lin, Microsoft Research

Chair: Shangguang Wang, Beijing University of Posts and Telecommunications

09:40-10:20

Some Architectural Considerations in Designing Service-enabled, IoT-aware and Proactive BPM Systems

Yanbo Han, North China University of Technology

Break | 10:20-10:30

Parallel Sessions

10:30-11:45

Click the Session Title to Access the Details

Zoom ID: 870 2542 0666 (Room 1)	Zoom ID: 859 8085 1580 (Room 2)	Zoom ID: 834 9183 6227 (Room 3)
Paper Session 3	**Paper Session 4**	**Paper Session 5**
AI-Inspired Services	Data-based Services	Service Security and Privacy

Lunch | 11:45-13:30

13:30-17:00

Click the Session Title to Access the Details

Zoom ID: 870 2542 0666 (Room 1)	Zoom ID: 859 8085 1580 (Room 2)	Zoom ID: 834 9183 6227 (Room 3)
Panel 5	**Invited Session 3**	**Invited Session 4**
Ph.D Symposium	Service-Based Integration of IoT and Business Processes (14:00-17:00)	Technologies for Computing Force Network Service

17:00-17:30

Chair: Shangguang Wang, Beijing University of Posts and Telecommunications

Zoom ID: 870 2542 0666 (Room 1)

Awards & Closing Ceremony

-Awards Announcement-
-Message of CCF ICSS 2023 Organizer-
-CCF ICSS 2022 Summarization-

- ZOOM GUIDELINE -

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- China Standard Time (CST)
- UTC/GMT+08:00

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- PRESENTATION GUIDELINE -

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- Please make sure your presentation is well timed.
- Please join the meeting room 10 minutes in advance.
- The conference encourages all presenters to make live oral presentations.

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STEP 1
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- KEYNOTE SPEAKER -

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Zoom ID: 870 2542 0666 (Room 1)

Xiaofei Xu

Harbin Institute of Technology

Prof. Xu Xiaofei is vice president of Harbin Institute of Technology (HIT), president of HIT-Weihai Campus, and director of the Research Institute of Intelligent Computing for Enterprises and Services of HIT(HIT-ICES). He is also fellow and council member of China Computer Federation (CCF), vice director of China University Teaching Steering Committee on Software Engineering, vice director of China University Teaching Steering Committee on Teaching Digitalization and Innovation, vice chairman of China Industry-University-Research Association on New Engineering on Information Technology. His research interests include service computing, software service engineering, big service and Internet of Services (IoS), enterprise computing and enterprise interoperability, software engineering, data mining and business intelligence, etc. He has been in charge of more than thirty Chinese national key research projects and key projects of China Natural Science Foundation or provincial scientific foundations. He has been general co-chairs or PC co-chairs in more than 30 international conferences, including IEEE ICWS, SCC, ICSOC, ICSS, CEISEE, etc. He has won IEEE TCSVC Outstanding Awards, and received twenty national and provincial awards on teaching and research. He is the author or co-author of more than 300 papers in international journals or conferences, and eight academic books. He has supervised 35 doctors and more than 100 masters.

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New Forms and Challenges of Services in Metaverse Ecosystems

With rapid development of new generation information technology, e.g. AI, VR/AR/MR, IoT, 5G/6G, NFT, block chain, cloud and edge computing, digital gaming, etc., the metaverse appears as a new form of information society. In metaverse ecosystems, the digital virtual society interacts with the real world very deeply and frequently in different forms such as digital twins, virtual natives, virtual-real interaction and symbiosis. The new features of digital technologies and virtual-real interactive societies in metaverse causes big changes of services in the new environment. The immersion, interactivity, mapping, experiential, and imagination of virtual-real world in metaverse require more interoperability and convergence across multi-domains and multi-worlds, more user friendly experiential, more complicated mapping and diverse forms of services between/across digital virtual world and real world. Even the ethos, thinking and approaches to apply services for business and human life in metaverse will be greatly changed. In this keynote speech, the new chances and challenge problems of services in metaverse ecosystems will be introduced. The insights about new forms, features, architectures, human-system interaction approaches, methodologies, key support techniques, and typical application scenarios of big service in metaverse environment will be presented. The excited new era of metaverse is appearing, and the interested chances of metaverse services will be coming together. We should be ready for this time.

- KEYNOTE SPEAKER -

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Zoom ID: 870 2542 0666 (Room 1)

Shing-Chi Cheung

The Hong Kong University of Science and Technology

Prof. Shing-Chi (S.C.) Cheung received his Bachelor's degree in Electrical and Electronic Engineering from the University of Hong Kong, and his PhD degree in Computing from the Imperial College London. After doctoral graduation, he joined the Hong Kong University of Science and Technology (HKUST) where he is a professor of Computer Science and Engineering. He founded the CASTLE research group at HKUST and co-founded the International Workshop on Automation of Software Testing (AST), which is now an annual IEEE international conference. He serves on the editorial board of Science of Computer Programming (SCP) and Journal of Computer Science and Technology (JCST). He was an editorial board member of the IEEE Transactions on Software Engineering (TSE, 2006-9) and Information and Software Technology (IST, 2012-5). He participates actively in the program and organizing committees of major international software engineering conferences. He chaired the 19th Asia-Pacific Software Engineering Conference (APSEC) in 1996, 1997 and 2012. He was the General Chair of the 22nd ACM SIGSOFT International Symposium on the Foundations of Software Engineering (FSE 2014). He is an extended member of the ACM SIGSOFT executive committee. His research interests lie in the software engineering methodologies that boost developer productivity and code quality using software testing and analysis, artificial intelligence, software analytics and empirical software engineering. His works were awarded the ACM SIGSOFT Distinguished Paper five times. He is a distinguished member of the ACM. More information about his CASTLE research group can be found at http://castle.cse.ust.hk/castle/people.html.

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Testing Service-Oriented Software without Precise Test Oracles

A major challenge in testing service-oriented software like decentralized applications (DApps) is the indetermination of global states, making the design of precise test oracles difficult. In this talk, I will visit the use of Metamorphic Testing, which was originally proposed to address the test oracle problem, for testing service-oriented software. It is reported that metamorphic testing can effectively expose bugs in the services hosted by YouTube and Spotify. The testing technique has also been successfully deployed at Facebook (now called Meta). In the beginning of the talk, I will review the fundamental of metamorphic testing and its adoption. The core of metamorphic testing is the design of its underlying metamorphic relations. I will demonstrate the design of effective metamorphic relations for service-oriented software using an example of synchronization bug detection in DApps. The talk will be concluded with the discussion of various research opportunities.

- KEYNOTE SPEAKER -

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Zoom ID: 870 2542 0666 (Room 1)

Qingwei Lin

Microsoft Research

Dr. Qingwei Lin is a Sr. Principal Research Manager at the DKI (Data, Knowledge, Intelligence) area of Microsoft Research Asia. He is leading a team of researchers working on machine learning and data mining technologies for Cloud Intelligence/AIOps. In Cloud Intelligence/AIOps area, Qingwei has ~50 publications in influential conferences such as OSDI, NSDI, ICSE, FSE, AAAI, IJCAI, SigKDD, etc. The research technologies have been transferred into multiple Microsoft products, such as Azure, Office, Windows, etc. Qingwei chaired Microsoft company-wide "Cloud Service Intelligence Summit" for 4 consecutive years.

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Cloud Intelligence / AIOps: Infusing AI/ML into Cloud Computing Systems

In the past fifteen years, the most significant paradigm shift in the computing industry is the migration to cloud computing, which brings unprecedented opportunities of digital transformation to business, society, and human life. Therefore, the quality of cloud platforms, including reliability, availability, performance, capacity efficiency, security, sustainability, etc., has become immensely important. However, the distributed nature, massive scale, and high complexity of cloud platforms present huge challenges to design, build, and operate such systems effectively and efficiently.

To address these challenges, "Cloud Intelligence/AIOps" is to infuse AI/ML into the designing, building, and operation of high-quality and high-efficiency cloud systems at scale. In this talk, I will first introduce the concept of "Cloud Intelligence/AIOps" and its research landscape. Then using a few projects at Microsoft as examples, I will talk about the work from Microsoft Research and its impact. I will also discuss the research challenges and opportunities in this area moving forward.

- KEYNOTE SPEAKER -

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Zoom ID: 870 2542 0666 (Room 1)

Yanbo Han

North China University of Technology

Dr. Yanbo Han has been a professor in computer science since 2000 (first with the Institute of Computing Technology, Chinese Academy of Sciences, and now with the North China University of Technology). He holds a Ph.D. from the Technical University of Berlin. His research interests include Internet Computing, Stream Data Processing, Dependable Distributed Systems, and Business Process Management. He has authored or coauthored over 200 papers and 6 books. 12 of the acquired IPs have been transferred to the industry. Dr. Han has supervised 33 PhD theses. He has organized over 20 academic events as general chairs or program chairs, and has edited 14 journal special issues in the above-mentioned areas.

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Some Architectural Considerations in Designing Service-enabled, IoT-aware and Proactive BPM Systems

Proactiveness is a longed-for feature of today's BPM systems. IoT enables BPM to perceive and react to real-time events in our physical world, and thus facilitating proactiveness. Service computing can support BPM with a set of well-developed mechanisms of abstraction and inter-operation. In designing service-enabled, IoT-aware and proactive BPM systems, however, people are often confronted with such issues as excessive complexity and inefficiency in dealing with the fundamental misalignment of these three established paradigms. Besides technical and methodological support, suitable architectural designs can be of big help. This talk elaborates the challenging design issues, discusses key architectural considerations and trade-offs, and reports some intermediate progresses of an on-going project that tries to promote proactive BPM systems.

- PANEL 1 -

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China Standard Time (CST) UTC/GMT+08:00

Blockchain and Digital Economy

Session Chairs | Jiajing Wu, Sun Yat-sen University
Huawei Huang, Sun Yat-sen University

Zoom ID: 870 2542 0666 (Room 1)

https://us02web.zoom.us/j/87025420666

Time	#ID	Info.
13:30-13:45	Chair	Brief Introduction of the Panel
13:45-14:15	Panelist 1	Blockchain-Assisted Secure Data Sharing for Digital Economy **Meng Shen, Beijing Institute of Technology**
14:15-14:45	Panelist 2	Trade or Trick? Detecting and Characterizing Scam Tokens on Decentralized Exchanges **Haoyu Wang, Huazhong University of Science and Technology**
14:45-15:15	Panelist 3	Enabling Practices for Scalable Blockchain Storage **Jiang Xiao, Huazhong University of Science and Technology**
15:15-15:25		Break
15:25-15:55	Panelist 4	Towards New Generation Network Architecture via Blockchain Empowered Distributed Trust **Su Yao, Tsinghua University**
15:55-16:25	Panelist 5	Blockchain Technology and System **Xiulong Liu, Tianjin University**
16:25-16:55	Panelist 6	A Multiple-Blockchains based Service Monitoring Framework in Decentralized Edge Computing **Puwei Wang, Renmin University of China**
16:55-17:00		Panel Discussion

- PANEL 1 -

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China Standard Time (CST) UTC/GMT+08:00

Blockchain and Digital Economy

Session Chairs | Jiajing Wu, Sun Yat-sen University
Huawei Huang, Sun Yat-sen University

Zoom ID: 870 2542 0666 (Room 1)
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Panel Introduction: In this panel entitled " blockchain and digital economy", we invite six promising and pioneering researchers in this area to present their cutting-edge research outputs in this inspiring direction. The topics of this panel include blockchain scalability, blockchain-assisted secure data sharing for digital economy, blockchain empowered distributed trust, high-performance blockchain system, etc.

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Dr. Jiajing Wu is currently an Associate Professor with the School of Computer Science and Engineering, Sun Yat-sen University, China. She earned her Ph.D. degree from the Hong Kong Polytechnic University, Hong Kong in June, 2014. Her research focus includes blockchain, graph mining, and network science. She has published over 60 research papers on international journals and conferences, including 3 ESI high cited papers. Dr. Wu was a recipient of the Hong Kong Ph.D. Fellowship Scheme during her Ph.D. study in Hong Kong. She is a PI or co-PI of several blockchain-related research projects funded by NFSC, National Key R&D program, and Guangdong Basic and Applied Basic Research Foundation. She serves as an Associate Editor for the IEEE TRANSACTIONS ON CIRCUITS AND SYSTEMS—PART II: EXPRESS BRIEFS, and a guest editor of a series of international journals.

Dr. Huawei Huang is currently an Associate Professor with the School of Software Engineering, Sun Yat-sen University, China. He earned his Ph.D. degree in Computer Science and Engineering from the University of Aizu (Japan) in Sep., 2016. His current research interests mainly focus on blockchain. He has served a research fellow of Japan Society for the Promotion of Science (JSPS, a visiting scholar at Hong Kong Polytechnic University, a Program-Specific Assistant Professor at Kyoto University, Japan. He has published over 80 research papers on IEEE/ACM conferences and journals, including INFOCOM, ICDCS, IWQoS, IEEE JSAC, TPDS, TMC, TC, TCC, TGCN, IEEE Communications Magazine, IEEE Wireless Communications, IEEE Network, and etc. He is a PI or co-PI of several blockchain-related research projects funded by NFSC, CCF and Guangdong Basic and Applied Basic Research Foundation. He has served as a leading guest editor for blockchain special issues at IEEE JSAC and IEEE OJ-CS, the operation-committee chair for IEEE Symposium on Blockchain at IEEE SERVICES 2021, and the TPC chair for blockchain workshops organized at GLOBECOM'2021, GLOBECOM'2022, ICC'2022, and iThings'2022.

- PANEL 1 -

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China Standard Time (CST) UTC/GMT+08:00

Blockchain and Digital Economy

Session Chairs | Jiajing Wu, Sun Yat-sen University
Huawei Huang, Sun Yat-sen University

Zoom ID: 870 2542 0666 (Room 1)
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SPEECH TOPIC

Blockchain-Assisted Secure Data Sharing for Digital Economy

Meng Shen, Beijing Institute of Technology

Abstract: The sharing of data is the foundation of a vibrant Digital Economy, and has the potential to deliver tremendous benefits to all participants including both enterprises and individuals. However, the expansion of data sharing means there is an urgent need to address the issues of trust and privacy protection—an area where the emerging blockchain technology offers considerable advantages. This talk will describe in detail the requirements and challenges in secure data sharing in digital economy scenarios, introduce a blockchain-based architecture for secure data sharing, and discuss the integration of blockchain and cryptography techniques for privacy-preserving and collaborative data computing.

PANELIST BIO

Meng Shen is a full Professor in the School of Cyberspace Science and Technology, Beijing Institute of Technology, Beijing, China. He received the B.Eng degree from Shandong University, Jinan, China in 2009, and the Ph.D. degree from Tsinghua University, Beijing, China in 2014, both in computer science. His research interests include data privacy and security, blockchain applications, and encrypted traffic classification. He has authored over 60 papers in top-level journals and conferences, such as ACM SIGCOMM, IEEE JSAC, and IEEE TIFS. He has guest edited special issues on emerging technologies for data security and privacy in IEEE Network and IEEE Internet-of-Things Journal. He received the Best Paper Award at IEEE/ACM IWQoS 2021. Dr. Shen was selected by the Beijing Nova Program 2020 and was the winner of the ACM SIGCOMM China Rising Star Award 2019.

- PANEL 1 -

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Blockchain and Digital Economy

Session Chairs | Jiajing Wu, Sun Yat-sen University
Huawei Huang, Sun Yat-sen University

Zoom ID: 870 2542 0666 (Room 1)

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SPEECH TOPIC

Trade or Trick? Detecting and Characterizing Scam Tokens on Decentralized Exchanges

Haoyu Wang, Huazhong University of Science and Technology

Abstract: The prosperity of the cryptocurrency ecosystem drives the need for digital asset trading platforms. Beyond centralized exchanges (CEXs), decentralized exchanges (DEXs) are introduced to allow users to trade cryptocurrency without transferring the custody of their digital assets to the middlemen, thus eliminating the security and privacy issues of traditional CEX. Uniswap, as the most prominent cryptocurrency DEX, is continuing to attract scammers, with fraudulent cryptocurrencies flooding in the ecosystem. In this talk, I will present our work on detecting and characterizing scam tokens on Uniswap. We have identified over 10K scam tokens listed on Uniswap, which suggests that roughly 50% of the tokens listed on Uniswap are scam tokens. All the scam tokens and liquidity pools are created specialized for the ``rug pull'' scams, and some scam tokens have embedded tricks and backdoors in the smart contracts. We further observe that thousands of collusion addresses help carry out the scams in league with the scam token/pool creators. The scammers have gained a profit of at least $16 million from 39,762 potential victims. Our observations suggest the urgency to identify and stop scams in the decentralized finance ecosystem, and our approach can act as a whistleblower that identifies scam tokens at their early stages.

PANELIST BIO

Haoyu Wang is a Full Professor in the School of Cyber Science and Engineering at Huazhong University of Science and Technology (HUST). He is leading the SECURITY PRIDE Research Group (Security, Privacy, and Dependability in Emerging Software Systems). His research covers a wide range of topics in Software Analysis, Privacy and Security, eCrime, Internet/System Measurement, and AI Security. He has published over 90 peer-reviewed papers, including 48 full papers published in top-tier venues (41 CCF-A Papers, and 39 CSRankings Papers). He has been awarded three best/distinguished paper awards, including WWW 2020 Best Student Paper Award (the first award from China), and ACM OOPSLA 2020 Distinguished Paper Award. His research has been covered by over 20 media outlets all around the world, including CoinDesk, Yahoo Finance, Coin Geek, Publish0x, nasdaq.com, Cryptonews CoinGenius, etc.

- PANEL 1 -

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China Standard Time (CST) UTC/GMT+08:00

Blockchain and Digital Economy

Session Chairs | Jiajing Wu, Sun Yat-sen University
Huawei Huang, Sun Yat-sen University

Zoom ID: 870 2542 0666 (Room 1)
https://us02web.zoom.us/j/87025420666

SPEECH TOPIC

Enabling Practices for Scalable Blockchain Storage

Jiang Xiao, Huazhong University of Science and Technology

Abstract: Blockchain holds out the promise of being the trust machine the `Web 3.0 `. It is foreseeable that there will be a significant number of blockchain systems launched to disrupt all sectors of our life. In this light, 'scalable blockchain storage' is perceived as the prominent characteristic of facilitating the mainstream blockchain systems to empower the future ecosystem. This presentation will first present the fundamental primitives and long faced challenges of designing a scalable, efficient, and secure blockchain storage framework. Second, the primary design principles and new approaches will be laid out. Finally, I will give a glimpse of the emerging trends.

PANELIST BIO

Jiang Xiao is currently an associate professor in School of Computer Science and Technology at Huazhong University of Science and Technology (HUST), Wuhan, China. She received the BSc degree from HUST in 2009 and the PhD degree from Hong Kong University of Science and Technology (HKUST) in 2014. She has been engaged in research on blockchain and distributed computing. Jiang has directed and participated in many research and development projects and grants from funding agencies such as National Key R&D Program Youth Scientist Project, National Natural Science Foundation of China (NSFC), Hong Kong Research Grant Council (RGC), Hong Kong Innovation and Technology Commission (ITC), and industries like Huawei, Tencent and Intel, and been invited by NSFC in reviewing research projects. Her awards include CCF-Intel Young Faculty Research Program 2017, Hubei Downlight Program 2018, ACM Wuhan Rising Star Award 2019, and Best Paper Awards from IEEE ICPADS/GLOBECOM/GPC.

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China Standard Time (CST) UTC/GMT+08:00

Blockchain and Digital Economy

Session Chairs | Jiajing Wu, Sun Yat-sen University
Huawei Huang, Sun Yat-sen University

Zoom ID: 870 2542 0666 (Room 1)
https://us02web.zoom.us/j/87025420666

SPEECH TOPIC

Towards New Generation Network Architecture via Blockchain Empowered Distributed Trust

Su Yao, Tsinghua University

Abstract: When the Internet was born, the number of users was in the millions, and there was a foundation of trust between users and the network. However, with the continuous development of the Internet, the number of users has reached billions and continues to grow. Data centers, cloud computing, edge computing and other technologies are widely used in the Internet, and the interaction between users and the network is more complex. The performance-oriented design of the traditional Internet architecture has led to its lack of trust foundation and facing serious security threats. These problems also exist in other networks. So far, various security solutions cannot fundamentally solve the various threats faced by networks. To solve this problem, we will discuss how to build the new generation of Network architecture supported by distributed trust based on blockchain technology. Then, we will discuss the research status on decentralized network infrastructure, and our design for decentralized network security architecture, including research objective, research content and research difficulties. Finally, we will showcase a blockchain-assisted secure and lightweight authentication solution as an example.

PANELIST BIO

Su Yao received his Ph.D. degree from the National Engineering Laboratory for Next Generation Internet Interconnection Devices, Beijing Jiaotong University. Currently, he serves in the National Research Center for Information Science and Technology, Tsinghua University, as an assistant research fellow. His research interests include future network architecture, blockchain system , and artificial intelligence for network system. He co-lectured with Professor Xu Ke on Cyber Intelligent Economy and Blockchain at Tsinghua University. He is an executive member in CCF Technical Committee on Blockchain.

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Blockchain and Digital Economy

Session Chairs | Jiajing Wu, Sun Yat-sen University
Huawei Huang, Sun Yat-sen University

Zoom ID: 870 2542 0666 (Room 1)
https://us02web.zoom.us/j/87025420666

SPEECH TOPIC

Blockchain Technology and System

Xiulong Liu, Tianjin University

Abstract: This talk starts with the brief introduction of blockchain and the milestones in development process. Through the analysis of cutting-edge blockchain technologies, this talk summarizes the critical challenges in the blockchain research area. Furthermore, this talk presents a blockchain system named Haihe-Smart-Chain developed by the research group, and key techniques involved in it. Finally, this talk discusses the future directions of blockchain.

PANELIST BIO

Xiulong Liu is a full-time professor in College of Intelligence and Computing, Tianjin University, China. Before that, he received the B.E. and Ph.D. degrees from Dalian University of Technology (China) in 2010 and 2016, respectively. He also worked as a visiting researcher in Aizu University, Japan; a postdoctoral fellow in The Hong Kong Polytechnic University, Hong Kong; and a postdoctoral fellow in the School of Computing Science, Simon Fraser University, Canada. His research interests include wireless human activity recognition, indoor localization and IoT security&privacy, etc. His research papers were published in many prestigious journals and conferences including MobiCom, INFOCOM, TON, TMC, TC, TPDS, IMWUT, TCOM, etc. He received Best Paper Awards from ICA3PP 2014 and IEEE System Journal 2017. He is also the recipient of CCF Outstanding Doctoral Dissertation award 2017.

- PANEL 1 -

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Blockchain and Digital Economy

Session Chairs | Jiajing Wu, Sun Yat-sen University
Huawei Huang, Sun Yat-sen University

Zoom ID: 870 2542 0666 (Room 1)

https://us02web.zoom.us/j/87025420666

SPEECH TOPIC

A Multiple-Blockchains based Service Monitoring Framework in Decentralized Edge Computing

Puwei Wang, Renmin University of China

Abstract: In edge computing, applications are usually delivered as services, each of which runs independently and can cooperate to construct complicated applications. However, it is difficult to monitor services in a decentralized environment since there does not exist central authorization to guarantee trustiness of the service quality data collected. To address the issue, we introduce the blockchain techniques to service monitoring. Considering the services are usually distributed on the edge nodes, if we deploy only a blockchain on the edge nodes near to the services, it may have to support both the service registration and monitoring because of the loose-coupling principle. That would influence the performance, even crash the edge nodes. In this talk, we introduce a multiple-blockchains based framework, including a registration blockchain that focuses on the service registration and discovery, and a set of monitoring blockchains that focus on the service invocation and monitoring. The registration blockchain is deployed on the cloud nodes, and the monitoring blockchains are deployed on the edge nodes near to the services for collecting efficiently and precisely the service quality data. Based on the cross-chain technology, we design a cross-chain service discovery between the monitoring blockchain and the registration blockchain for finding the services the requesters need. We have implemented the proposed framework on the blockchain platform Hyperledger Fabric and the edge computing platform KubeEdge.

PANELIST BIO

Puwei Wang received the PhD degree in computer science from the Institute of Computing Technology, Chinese Academy of Sciences. He is now an associate professor in School Information, Renmin University of China. He has presided over several scientific research projects, including General Programs of the National Natural Science Foundation of China, and has participated in several national major projects such as the National Key Research and Development Program and the 973 Program of China. He has published more than 10 papers as the first author or corresponding author in top international journals and conferences, such as such as TPDS, TKDE, TSC, AAAI, ICWS and ICSOC, etc. His major research interests include service computing and blockchain.

- PANEL 2 -

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Regulation and Governance of Digital Services

Session Chairs | Guiling Wang, North China University of Technology;
Hanchuan Xu, Harbin Institute of Technology

Zoom ID: 859 8085 1580 (Room 2)
https://us02web.zoom.us/j/85980851580

Time	#ID	Info.
13:30-13:45	Chair	Brief Introduction of the Panel
13:45-14:15	Panelist 1	Exploration on the Theory and Technology of Service Regulation **Jianwei Yin, Zhejiang University**
14:15-14:45	Panelist 2	Service System Governance: Models and Methods **Zhongjie Wang, Harbin Institute of Technology**
14:45-15:15	Panelist 3	Demand-Supply Matching in Digital Services **Xiaoping Li, Southeast University**
15:15-15:25		Break
15:25-15:55	Panelist 4	Intelligent IoT services Provision Platform and Applications **Bo Cheng, Beijing University of Posts and Telecommunications**
15:55-16:25	Panelist 5	AI-Empowered Quality of Service Guarantee for Microservices **Tao Wang, Institute of Software, Chinese Academy of Sciences**
16:25-16:55	Panelist 6	Service Regulation and Governance for Intelligent Software Development **Jianxun Liu, Hunan University of Science and Technology**
16:55-17:00		Panel Discussion

- PANEL 2 -

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Regulation and Governance of Digital Services

Session Chairs | Guiling Wang, North China University of Technology;
Hanchuan Xu, Harbin Institute of Technology

Zoom ID: 859 8085 1580 (Room 2)

https://us02web.zoom.us/j/85980851580

Panel Introduction: Based on the Cloud computing, AI, Big Data, IoT and mobile computing technologies, digital services can support the efficient matching between the providers and consumers in various industries of modern service societies. However, there emerges a series of problems because of the lack of regulation and insufficient means of governance. The efficient regulation and governance of digital services has become urgent.

This panel invites researchers to discuss how to establish an effective governance system for digital services to help the government and industry regulators reach a refined governance capacity, improve regulatory efficiency and reduce regulatory costs; how to improve the regulation and governance capabilities in various software such as big service systems, cross-border service systems, intelligent software, IoT platform and applications, process-aware information systems, etc.; and also the underlying theory and technologies related with this goal, including but not limited to: service regulation & governance system modeling; QoS guarantee for service systems; simulation and optimization for service systems; regulation and governance for service provision; regulation and governance for service ecosystems, service security and privacy; data provenance and tracing for services; fairness and explainability for intelligent service; etc.

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Dr. Guiling Wang is a professor at Beijing Key Laboratory on Integration and Analysis of Large-scale Stream Data, School of Information Science and Technology, North China University of Technology. From 2007-2011 she was an assistant professor and post doctor at Institute of Computing Technology, Chinese Academy of Sciences (ICT, CAS). She obtained her Ph.D. at DCST of Tsinghua University in 2007. Her current research interests include services computing, services for data integration, spatio-temporal data integration and analysis, etc. She has published 4 academic books, over 10 technical invention patents and more than 60 journal and conference papers including IEEE TSC, IEEE TITS, and WWW. She acted or is acting as the principal investigator (PI) or main member of projects supported by NSFC, National Key R&D Program of China, Beijing Natural Science Foundation, and industries (e.g. Huawei, CETC Ocean Corp.) etc.

Dr. Hanchuan Xu is an associate professor in Harbin Institute of Technology. He is an IEEE member and senior member of CCF. His research interests include services computing, software service engineering, intelligent services and optimization. He was/is leading and participated in more than 10 projects supported by National Key R&D Program of China, Natural Science Foundation of China, National 863 Hi-Tech R&D Program. He has achieved one First Class Prize and one Second Class Prize of Ministry/Province Science and Technology Progress Award, 18 invention patents/software copyrights. He is the author or co-author of more than 30 papers in journals or conferences, and 4 books.

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MAY 14 2022

China Standard Time (CST) UTC/GMT+08:00

Regulation and Governance of Digital Services

Session Chairs | Guiling Wang, North China University of Technology;
Hanchuan Xu, Harbin Institute of Technology

Zoom ID: 859 8085 1580 (Room 2)
https://us02web.zoom.us/j/85980851580

SPEECH TOPIC

Exploration on the Theory and Technology of Service Regulation

Jianwei Yin, Zhejiang University

Abstract: The advances in information technology have contributed to the prosperity of modern service industries. However, with the rapid development of modern service industry, many regulatory loopholes including service violations and service quality issues have been exposed. In order to protect the rights and interests of users, improve service quality, and ensure service compliance, it is urgent to comprehensively regulate and govern the service system, which has become an important responsibility of service platform operators and third-party regulators. However, due to the large scale and complexity of the service system of modern service industry and digital economy, huge challenges have emerged. The traditional service model based on the triangular service relationship lacks the mechanism of service regulation. Therefore, there is a compelling need to explore a new service model that supports service regulation for large-scale service systems. Alongside, a mature theoretical and technical system of service regulation is worth a lot of effort. This talk will highlight the challenges based on analysis of current situation of service regulation. For above issues, this talk is devoted to discussing the related works of service regulation, introducing a new service model for service regulation and exploring the technology system of service regulation.

SPEAKER BIO

Jianwei Yin is a Qiushi Distinguished Professor at the College of Computer Science, Zhejiang University. He is also serving as the executive vice dean of School of Software Technology of Zhejiang University, deputy dean of College of Computer Science of Zhejiang University, the executive vice dean of Binjiang Institute of Zhejiang University and the director of the Engineering Technology Research Center for E-Service in Modern Service Industry of Zhejiang Province. Prof. Yin is the winner of National Science Foundation for Distinguished Young Scholars, the project leader of the National Key Research and Development Program of China, and the project leader of National Science and Technology Major Project of the Ministry of Science and Technology of China. He is also selected to participate in National High-Level Personnel of Special Support Plan (known as "the Ten Thousand Talents Plan") and served as a member of the Expert Group of "Cultural Technology and Modern Service Industry" program of National Key Research and Development Program of China, a member of the E-commerce Teaching Steering Committee of the Ministry of Education of China, the vice chairman of China Service-Oriented Manufacturing Alliance under Ministry of Industry and Information Technology of China, the director of the Service Computing Technical Committee of the China Computer Federation(CCF TCSC), Associate Editor of IEEE TSC and a member of the New Generation Information Technology Expert Group of the Science and Technology Department of Zhejiang Province. His research interests mainly include service computing, distributed computing, mobile services and digital services. He has contributed significantly to these areas and published 100+ papers in international journals and conferences such as TC, TSE, TKDE, TPDS, TSC, TMC, CHI, ICDE, IJCAI, AAAI, ICDCS, ICSOC, ICWS, etc. He is the recipient of the ICSOC 2017 Best Paper Award, the ColllaborateCOM 2020 Best Paper Award and the IEEE SMDS 2020 Best Paper Award. Prof. Yin has instructed students to win the best Student Paper award in ICSS 2020, ICWS 2019, CollaborateCOM 2019 and IEEE SCC 2012. Many of his researches has been applied in about 100 large-scaled enterprises, including Alibaba, China Telecom, China Aerospace, ICBC, NetEase, Taobao, et al. He has 110 national invention patents, and won 1 Second Class Prizes of The State Science and Technology Progress Award and 5 First Class Prizes of Ministerial and Provincial-Level Science and Technology Awards.

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Regulation and Governance of Digital Services

Session Chairs | Guiling Wang, North China University of Technology;
Hanchuan Xu, Harbin Institute of Technology

Zoom ID: 859 8085 1580 (Room 2)

https://us02web.zoom.us/j/85980851580

SPEECH TOPIC

Service System Governance: Models and Methods

Zhongjie Wang, Harbin Institute of Technology

Abstract: Digital service systems are key constituents of digital economy, and how to conduct effective governance to enhance the operation performance of service systems has been a challenging issue in services computing research. Constituents of a governance system are to be studied, and a unified governance model composed of governance structure, governance means, and governance objectives is introduced. In order to guide the development of a governance system and improve governance capability, key technologies on governance system modeling, simulation and optimization are discussed. Typical governance patterns and key technologies for precise governance are summarized. The objective is to develop a novel frontier research direction on digital service governance theory, and to lay the theoretical and technological foundation for digital economy governance.

PANELIST BIO

Zhongjie Wang is Associate Director of Faculty of Computing, and Dean of School of Software, Harbin Institute of Technology. He is associate director of Technical Committee of Services Computing, CCF. His research interests include services computing and software engineering..

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Regulation and Governance of Digital Services

Session Chairs | Guiling Wang, North China University of Technology;
Hanchuan Xu, Harbin Institute of Technology

Zoom ID: 859 8085 1580 (Room 2)

https://us02web.zoom.us/j/85980851580

SPEECH TOPIC

Demand-Supply Matching in Digital Services

Xiaoping Li, Southeast University

Abstract: In digital services, the data related to service supplies is constrained by some constraints, e.g., security and privacy, which makes it much more difficult to match appropriate services for demands. In addition, there are many service candidates for each demand with different costs. How to match demands and service supplies is crucial for both customers and providers with different optimizing criteria concerns. In this topic, common demand-supply matching problems considering data constraints are analyzed which are further classified in terms of characteristics of demands, constraints, supplies and objectives. By analyzing the hardness of demand-supply matching problems, it seems that searching is the only solution. According to effectiveness, efficiency and robustness of optimization algorithms, demand patterns and supply patterns are integrated to intelligent methods for demand-supply matching. Several classical studies on demand-supply matching are introduced and future work in this domain is predicted.

PANELIST BIO

Xiaoping Li is a distinguished professor in Southeast University. He is an IEEE Senior member and a Distinguished member of China Computer Federation (CCF). He received his B.Sc. and M.Sc. degrees in Applied Computer Science from the Harbin University of Science and Technology in 1993 and 1999, respectively, and the Ph.D. degree in Applied Computer Science from the Harbin Institute of Technology in 2002. He is a full professor at the School of Computer Science and Engineering, Southeast University, Nanjing, China. He is the author or co-author over more than 100 academic papers, some of which have been published in international journals such as IEEE Transactions on Computers, IEEE Transactions on Parallel and Distributed Systems, IEEE Transactions on Services Computing, IEEE Transactions on Cybernetics, IEEE Transactions on Automation Science and Engineering, IEEE Transactions on Cloud Computing, IEEE Transactions on Systems, Man and Cybernetics: Systems, Science in China Series F: Information Sciences, ICSOC, ICPADS, ICWS, SMC, CASE, CSCWD. His research interests include Scheduling in Cloud Computing, Scheduling in Cloud Manufacturing, Service Computing, Big Data and Machine Learning.

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MAY 14, 2022

China Standard Time (CST) UTC/GMT+08:00

Regulation and Governance of Digital Services

Session Chairs | Guiling Wang, North China University of Technology;
Hanchuan Xu, Harbin Institute of Technology

Zoom ID: 859 8085 1580 (Room 2)

https://us02web.zoom.us/j/85980851580

SPEECH TOPIC

Intelligent IoT services Provision Platform and Applications

Bo Cheng, Beijing University of Posts and Telecommunications

Abstract: The IoT has widely penetrated into all fields of the national economy. It has become a national strategy and an important part of modern service industry. Currently, the IoT industry is building many low-level application systems with duplicated development efforts, and a common IoT platform is lacking. In this topic, we will introduce the Intelligent IoT services provision platform based on the event driven service-oriented architecture paradigm. Focusing on the event driven SOA based for IoT service platform, resource dynamic access and management framework, distributed message distribution and communication space, large scale complex event processing engine, multiple business process design and interaction pattern, and so on. Finally, we will illustrate some typical intelligent IoT applications.

PANELIST BIO

Bo Cheng received the Ph.D. degree in computer science and engineering from University of Electronic Science and Technology of China in 2006. He is currently a Professor with the State Key Laboratory of Networking and Switching Technology, Beijing University of Posts and Telecommunications, China. He has published more than 100 articles in international journals and conference proceedings, including the IEEE/ACM TON、TMC、TPDS、TKDE、TSC、TNSM and IEEE ICWS、ICSOC、SCC. His current research interests include network services and intelligence, Internet of Things technology, communication software and distributed computing.

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China Standard Time (CST) UTC/GMT+08:00

Regulation and Governance of Digital Services

Session Chairs | Guiling Wang, North China University of Technology;
Hanchuan Xu, Harbin Institute of Technology

Zoom ID: 859 8085 1580 (Room 2)

https://us02web.zoom.us/j/85980851580

SPEECH TOPIC

AI-Empowered Quality of Service Guarantee for Microservices

Tao Wang, Institute of Software, Chinese Academy of Sciences

Abstract: With the continuous emergence of Internet-based innovation models, the traditional monolithic software architecture cannot well adapt to the rapid business development and the changing customers' requirements. The microservice architecture has become one of the main implementation forms of Internet-based applications due to its advantages of easy expansion, high fault tolerance, and maintainability. Microservices have raised challenges for guaranteeing the quality of service (QoS) as follows. First, the existing studies do not fully characterize microservices' complex features of workloads, so cannot predict the changing status. Moreover, they do not analyze microservices' dynamic invocation behaviors from the perspective of the whole application, so they cannot effectively detect anomalous microservices in a fine grain. Finally, they do not carefully consider microservices' different QoS requirements in various contexts, so they cannot precisely adjust microservices' resources. To address the above issues, this report introduces our current work empowered with AI, and directs the possible future work to provide the technical supports for the implementation of microservice applications with sustainable high-quality services.

PANELIST BIO

Tao Wang received his Ph.D. degree in computer software and theory from the Institute of Software, Chinese Academy of Sciences in 2014, and his M.S. degree in computer architecture from the University of Electronic Science and Technology of China in 2008. He is an Associate Professor with Institute of Software, Chinese Academy of Sciences. His current research interests include quality of service, software reliability, and AIOps for microservices.

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Regulation and Governance of Digital Services

Session Chairs | Guiling Wang, North China University of Technology;
Hanchuan Xu, Harbin Institute of Technology

Zoom ID: 859 8085 1580 (Room 2)

https://us02web.zoom.us/j/85980851580

SPEECH TOPIC

Service Regulation and Governance for Intelligent Software Development

Jianxun Liu, Hunan University of Science and Technology

Abstract: Service Oriented Architecture (SOA) and Web services play an important role for modern software development. The Web services ecosystems is right now forthcoming as the number of Web services deployment and application in the network are rapidly increased. The regulation and governance of the Web services ecosystems to enhance intelligent software development becomes an urgent task for researchers in services computing domain . We will here briefly introduce what the Web services ecosystem is from our point of view at first. Then we will illustrate some of our work in this research direction.

PANELIST BIO

Jianxun Liu is a professor in Hunan University of Science and Technology. He got his master degree and Ph.D both in computer science from Central South University and Shanghai Jiao Tong University in 1997 and in 2003, respectively. He was the dean of School of Computer Science and Engineering, Hunan University of Science and Technology, China, from March 30th, 2017 to March 1st ,2021. During this period, the school got the doctoral program of software engineering and computer science becomes top 1% in ESI list. Prof. Liu's research interests are services computing and cloud computing as well as business intelligence. He has published more than 50 peered reviewed papers in international journals such as ACM TWeb, IEEE TPDS, IEEE TKDE, IEEE TCC, IEEE TSC, IEEE TNSM and in international conferences IJCAI, IEEE ICWS and etc.

- PANEL 3 -

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MAY 14, 2022

China Standard Time (CST) UTC/GMT+08:00

Computing Force Network

Session Chair | Lu Lu, China Mobile Research Institute

Zoom ID: 834 9183 6227 (Room 3)
https://us02web.zoom.us/j/83491836227

Time	#ID	Info.
13:30-13:45	Chair	Brief Introduction of the Panel
13:45-14:15	Panelist 1	Welcome Speech **Xiaodong Duan, China Mobile Research Institute**
14:15-14:45	Panelist 2	Key Technologies of Computing Power in 6G Communication, Sensing, and Computing Converged Systems **Mugen Peng, Beijing University of Posts and Telecommunications**
14:45-15:15	Panelist 3	Automatic Scheduling of Computing-power Network Driven by Knowledge Graph **Hongzhi Wang, Harbin Institute of Technology**
15:15-15:25		Break
15:25-15:55	Panelist 4	Research and Thinking on Full Stack Acceleration of XPU Computing Platform **Hongwei Kan, Inspur**
15:55-16:25	Panelist 5	Federation Computing across Clouds and Edges **Deke Guo, National University of Defense Technology**
16:25-16:55	Panelist 6	Information Superbahn: Infrastructure Testbed for Future Computing Networks **Lin Tian, Institute of Computing Technology, Chinese Academy of Science**
16:55-17:25	Panelist 7	Computing Force Network: A New Service Model in Digitalization Era **Tao Sun, China Mobile Research Institute**

- PANEL 3 -

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China Standard Time (CST) UTC/GMT+08:00

Computing Force Network

Session Chairs | Lu Lu, China Mobile Research Institute

Zoom ID: 834 9183 6227 (Room 3)
https://us02web.zoom.us/j/83491836227

Panel Introduction: "Computing Force Network" is the deep convergence of the two disciplines of network and computing in the digital era. It is the further development of cloud network integration. It will produce new innovative technologies and bring new service modes. It is also an important basic technology for 6G and future network development, which has been highly concerned by the academic and industrial area. Relying on the 15th International Conference on Service Science of CCF (CCF ICSS 2022), this forum invited scholars and experts from academia and industry to conduct in-depth discussion on computing, perception, communication, service and other aspects around computing force network.

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Lu Lu, associate director of the Department of Infrastructural Network Technology Research in China Mobile Research Institute, has been engaged in technological innovation in network communication and mobile communication for 17 years, and has rich experience in 5G network architecture, 6G network architecture, network intelligence, computing force network, deterministic network, digital twin network and other fields as well as domestic and international standardization. At present, she is mainly engaged in the research of 6G and computing force network technology. She has served as the vice chairman of ITU SG13 Wp1, led the standardization management and coordination of five research groups related to IMT-2020 requirements and architecture, network slicing, emerging technologies, fixed mobile integration and QoS, and was responsible for the standardization promotion of IMT-2020/5G and future network evolution. In terms of domestic standardization, she has served as the leader of CCSA TC5 WG12 core network group since April 2017.

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China Standard Time (CST) UTC/GMT+08:00

Computing Force Network

Session Chairs | Lu Lu, China Mobile Research Institute

Zoom ID: 834 9183 6227 (Room 3)

https://us02web.zoom.us/j/83491836227

SPEECH TOPIC

Welcome Speech

Xiaodong Duan, China Mobile Research Institute

Abstract: In recent years, the role of the new engine of digital economy has become more and more obvious. It is becoming a key force to restructure global factor resources, reshape the global economic structure and change the global competition pattern. "New infrastructure" is the strategic demand of serving the long-term development of the country and the construction of "network power" in the digital economy era. The Counting from the East to the West project is also effectively promoting the flow of social computing resource and the implementation of new national infrastructure.

Computing Force Network is the technical direction put forward by China's communication industry. It is a collection of computing resource + connection resource, which reflects the integration demands of the new infrastructure for 5G, IoT, data center computing integration infrastructure, AI, cloud computing, blockchain and other new technology service infrastructure. This forum hopes to invite representatives of academic and industry computing network research to conduct in-depth discussion on the development trend, industry demand, technical architecture and new services of computing force network , so as to promote the consensus in the field of computing force network and work together as soon as possible.

PANELIST BIO

Duan Xiaodong is currently the vice president of the China Mobile Research Institute. He has been engaged in the research and development of IP Network, next generation Internet, mobile network, NFV/SDN driven operator network evolution, VoLTE and 5G network technology for many years. He is the leader of China Mobile's standardization participating teams in IETF, ONF and OPEN-O. He has successively won the national special prize for Scientific and Technological Progress; the second award of the Scientific and Technological Progress of the State; CCSA Science and Technology Award; China Communications Association Progress Award and other more than 10 provincial and ministerial awards, and has won the Scientific and Technological Progress award of China Mobile Communication Corporation for many times; He was selected into the national hundred and ten million talent project in 2019 and was awarded the honorary title of "middle-aged and young experts with outstanding contributions"; Honorary title of "model worker of central enterprises".

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China Standard Time (CST) UTC/GMT+08:00

Computing Force Network

Session Chairs | Lu Lu, China Mobile Research Institute

Zoom ID: 834 9183 6227 (Room 3)

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SPEECH TOPIC

Key Technologies of Computing Power in 6G Communication, Sensing, and Computing Converged Systems

Mugen Peng, Beijing University of Posts and Telecommunications

Abstract: With intelligent services flourishing drastically, 6G is expected to bridge the physical and virtual worlds and bring technical improvements with native intelligent perception and adaptive computing capability. More specifically, 6G will integrate communication, sensing, and computing, which has become a focus both in academia and industry. As the cornerstone of this converged 6G, computing power is spreading along the network from the cloud to network edge and terminals. A number of key technologies of computing power are emerging to provide adaptive computing capability, e.g., network cloudification and computing power networking. In this process, a variety of challenges arise, including: (1) What does the next network architecture look like following the trend of integration of networking and computing so as to provide an integrated solution for various services? (2) How does 6G provide time-sensitive computing power when a service come into being? (3) How does 6G provide intelligent computing power so as to be service-aware? In this talk, we will try to answer these questions and give our insights.

PANELIST BIO

Mugen Peng is currently a Full Professor with the School of Information and Communication Engineering. His main research areas include wireless communication theory, radio signal processing, cooperative communication, self-organization networking, heterogeneous networking, cloud communication, and Internet of Things. Dr. Peng has authored and co-authored over 150 refereed IEEE journal papers and over 250 conference proceeding papers. He is the Fellow of IEEE, CIE and CIC.

Dr. Peng was a recipient of the 2018 Heinrich Hertz Prize Paper Award, the 2014 IEEE ComSoc AP Outstanding Young Researcher Award, and the Best Paper Award in the JCN 2016, ICCC 2020, IEEE WCNC 2015, etc. He is currently or have been on the Editorial/Associate Editorial Board of the IEEE Network, the IEEE Communications Magazine, the IEEE Internet of Things Journal, the IEEE Transactions on Vehicular Technology, the IEEE Transactions on Network Science and Engineering, the Intelligent and Converged Networks, and the Digital Communications and Networks (DCN).

- PANEL 3 -

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Computing Force Network

Session Chairs | Lu Lu, China Mobile Research Institute

Zoom ID: 834 9183 6227 (Room 3)

https://us02web.zoom.us/j/83491836227

SPEECH TOPIC

Automatic Scheduling of Computing-power Network Driven by Knowledge Graph

Hongzhi Wang, Harbin Institute of Technology

Abstract: In practice, one of the major problems that the computing-power network faces is the scheduling problem for the computing power. To address this problem, we proposed the knowledge-driven computing-power network strategy. The development of knowledge graphs makes it possible to automatically adjust the networks driven by knowledge, but it also brings challenges such as the mixture of qualitative and quantitative knowledge, the combination of time series and affair logic, and the difficulty of large-scale knowledge graph management. In this talk, I will introduce the application of automatic scheduling for the computing power network driven by knowledge graph, the challenges of knowledge representation, management and cleaning as well as our research results in this area, including knowledge graph generation, knowledge reasoning techniques and efficient management method of the large-scale knowledge graph.

PANELIST BIO

Hongzhi Wang, Professor, PHD supervisor, the head of massive data computing center and the vice dean of the honors school of Harbin Institute of Technology, the secretary general of ACM SIGMOD China, outstanding CCF member, a standing committee member CCF databases and a member of CCF big data committee. Research Fields include big data management and analysis, database systems, knowledge engineering and data quality. He was "starring track" visiting professor at MSRA and postdoctoral fellow at University of California, Irvine. Prof. Wang has been PI for more than 10 national or international projects including NSFC key project, NSFC projects and National Technical support project, and co-PI for more than 10 national projects include 973 project, 863 project and NSFC key projects. He also serves as a member of ACM Data Science Task Force. He has won First natural science prize of Heilongjiang Province, MOE technological First award, Microsoft Fellowship, IBM PHD Fellowship and Chinese excellent database engineer. His publications include over 300 papers in the journals and conferences such as VLDB Journal, IEEE TKDE, VLDB, SIGMOD, ICDE and SIGIR, 6 books and 6 book chapters. His PHD thesis was elected to be outstanding PHD dissertation of CCF and Harbin Institute of Technology. He severs as the reviewer of more than 20 international journal including VLDB Journal, IEEE TKDE, and PC members of over 50 international conferences including SIGMOD, VLDB, KDD, ICML, NeurpIS, ICDE, etc. His papers were cited more than 3500 times. His personal website is http://homepage.hit.edu.cn/wang.

- PANEL 3 -

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China Standard Time (CST) UTC/GMT+08:00

Computing Force Network

Session Chairs | Lu Lu, China Mobile Research Institute

Zoom ID: 834 9183 6227 (Room 3)
https://us02web.zoom.us/j/83491836227

SPEECH TOPIC

Research and Thinking on Full Stack Acceleration of XPU Computing Platform

Hongwei Kan, Inspur

Abstract: For various GPU / DPU / NPU / IPU and other new XPU computing platforms, the report introduces its full stack acceleration architecture and programming mode, gives the current research hotspots and pain points, as well as the innovative practice of the HSS Lab in representative research points, and discusses how to carry out joint academic innovation in the Industry and University with the times.

PANELIST BIO

Hongwei Kan, Principal Scientist, State Key Laboratory for High-End Server and Storage Technology, China. and the INSPUR Fpga Cloud Platform Acceleration Innovation Team. Government experts (Innovative Talent, Class A) in Quancheng, Jinan. etc. At present, he works on the research of reconfigurable distributed heterogeneous acceleration platform for AI and edge computing and data center, and the original basic research of AI algorithm model and feature measurement direction. He focuses on distributed acceleration platform, CPU-FPGA-xPU full stack acceleration, data center resource pooling/cloudification/ Hot-Plug, AI algorithm analysis platform and evaluation system, hard real-time operating system and so on..

- PANEL 3 -

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Computing Force Network

Session Chairs | Lu Lu, China Mobile Research Institute

Zoom ID: 834 9183 6227 (Room 3)

https://us02web.zoom.us/j/83491836227

SPEECH TOPIC

Federation Computing across Clouds and Edges

Deke Guo, National University of Defense Technology

Abstract: This talk will discuss the evolution path of network computing from the C/S, P2P, grid computing, cloud computing to edge computing. Then, we analyze how to realize collaborative computing architecture across multiple edge computing environments and cloud computing environments. We mainly introduce the new architecture of the federation computing, the storage method, the scheduling method of tasks, and the edge intelligence method.

PANELIST BIO

Deke Guo received his B.E. degree in Department of Industry Engineering from Beijing University of Aeronautic and Astronautic, and his Ph.D. degree in School of Information System and Management, National University of Defense Technology. He is currently a Professor with the College of System Engineering. His research interests include distributed systems, software-defined networking, data center networking, wireless and mobile systems, and interconnection networks.. In 2020, he has been elected as the CCF-IEEE CS young computer scientist. He has received the first prize in Hunan's Natural Science Award, and is the principal investigator. He has published 61 papers in ACM/IEEE transactions journals, such as TON, TOC, TKDE, TPDS, TMC, and 45 papers of tier A Journals or Conference recommended by the China Computer Federation(CCF), and the Best Paper in the international conference of IEEE ICNP 2019. He has 58 and 9 first-authored invention patents in China and the United States, respectively. He has published 3 books as the first author.

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China Standard Time (CST) UTC/GMT+08:00

Computing Force Network

Session Chairs | Lu Lu, China Mobile Research Institute

Zoom ID: 834 9183 6227 (Room 3)
https://us02web.zoom.us/j/83491836227

SPEECH TOPIC

Information Superbahn: Infrastructure Testbed for Future Computing Networks

Lin Tian, Institute of Computing Technology, Chinese Academy of Science

Abstract: Information Superbahn proposed by the Institute of Computing technology, Chinese Academy of Sciences is an innovative action plan for the future Computing Network. The goal of Information Superbahn is to connect computing resources of cloud, edge and terminal together in a wide-area environment, to provide on-demand services in collaboration with multi-location, multi-level and multi-type computing resources. It is can be seen that Information Superbahn is a new type of computing infrastructure. A large-scale testbed is required to verify the related technologies and systems. Therefore, we are building the Information Superbahn testbed to push the development of the new generation of computing network.

PANELIST BIO

LIN TIAN is a professor with the Distributed System Research Center, the Institute of Computing Technology (ICT), Chinese Academy of Sciences (CAS). Her research interests include the fields of computing and communication convergence, edge computing. She has published over 50 research papers and two books. She received the Best Paper Awards from WCNC2013, ISCIT2016, and ICC2018. Besides, she is the inventor of 39 Chinese and international patents. She has won the second prize of Beijing Science and Technology Award, the second prize of Electronic Information Science and Technology Award of China Electronics Society, as well as the second prize of Beijing Patent Award, etc. And relevant achievements have been already productization.

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MAY 14, 2022

China Standard Time (CST) UTC/GMT+08:00

Computing Force Network

Session Chairs | Lu Lu, China Mobile Research Institute

Zoom ID: 834 9183 6227 (Room 3)
https://us02web.zoom.us/j/83491836227

SPEECH TOPIC

Computing Force Network: A New Service Model in Digitalization Era

Tao Sun, China Mobile Research Institute

Abstract: Digital information infrastructure is the cornerstone of the development of digital economy. Its' key demand is ultra-high speed information exchange and ultra-high performance information data processing, whose core is "network" + "computing". Computing force network promotes the deep convergence of computing and network to produce new disciplines, and promotes the emergence of new technologies such as computing force modeling, computing force perception and routing, computing transaction, as well as new services such as super large-scale computing and computing grid connection. This speech aims to put forward new services and new models in the era of computing force, and jointly discuss how to promote the in-depth development of computing force network.

PANELIST BIO

Tao Sun received the B.S. degree with the Department of Automation, in 2003 and Ph.D. degree in Control Science and Engineering, in 2008, both from Tsinghua University, Beijing, China. He jointed China Mobile Research Institute from 2008, serving as Chief Expert since 2021. Dr. Sun acted as China Mobile 3GPP delegates since 2009. He was rapporteurs of many 3GPP work items such as Study of Next Generation Mobile Architecture, 5G System Architecture Phase 1, Enhancement of Service-based Architecture. He now is the Vice Chair of 3GPP SA2 and China Mobile's coordinator of 3GPP SA and CT groups. Dr. Sun has authored or coauthored about 30 papers including IEEE TAC, IEEE TASE, IEEE TII, China Communication, etc. He has been a Program or Session Chair IEEE EDGE, IEEE CLOUD, IEEE DTPI, CCF ICSS. He gave invited talk in WOCC 2019.
Dr. Sun received First Prize of Science and Technology from China Communications Standards Association, First Prize of Science and Technology from China Institute of Communications. He was awarded Distinguished Youth Engineer of Beijing.

- PANEL 4 -

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China Standard Time (CST) UTC/GMT+08:00

Sino-Australia Advanced Technology of Service Computing

Session Chairs | Qiang He, Swinburne University of Technology;
Shangguang Wang, Beijing University of Posts and Telecommunications

Zoom ID: 880 0896 9731 (Room 4)

https://us02web.zoom.us/j/88008969731

Panel Introduction: The theme of this panel is "Sino-Australia Advanced Technology of Service Computing". Six pioneering researchers from China and Australia and invited to present their latest studies in this area. The topics include edge-cloud collaboration, edge intelligence, cloud-native edge computing, edge smart UAVs, edge IoT, edge service management, etc.

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Qiang He is currently an associate professor at Swinburne University of Technology, Australia. His major research interests include edge computing, service-oriented computing, cloud computing and software engineering. He has published 160+ papers at top venues, e.g., TSE, TMC, TPDS, TIFS, TDSC, TBD, TSC, TCC, WWW, IJCAI, ICDE, ICDM, ICSOC and ICWS, including 30+ CCF A papers and 60+ ACM/IEEE Transactions papers. He is the recipient of the Best Student Paper Award at ICWS2019, Best Student Paper Awards at SCC2018 and ICWS2017 and the Best Paper Award at ICSOC2018, as well as the Outstanding Research Award at Swinburne in 2018 and 2020. He is the Chief Investigator of three Discovery Projects funded by the Australian Research Council, and a Cooperative Research Project funded by the Commonwealth Scientific and Industrial Research Organisation.

Shangguang Wang is a professor at the School of Computer Science, Beijing University of Posts and Telecommunications, China. He is the founder&chief scientist of Tiansuan Constellation. He is also the director of Star Network and Intelligence Computing Laboratory, and vice director of Sate Key Laboratory of Networking and Switching at BUPT.
His research interests include service computing, mobile edge computing, cloud computing, and satellite computing. He is currently serving as chair of IEEE Technical Committy on Services Computing(TCSVC), and vice chair of IEEE Technical Committee on Cloud Computing. He also served as general chairs or program chairs of 10+ IEEE conferences, advisor/associate editors of several journals such as Journal of Cloud Computing, Journal of Software: Practice and Experience, International Journal of Web and Grid Services, China Communications, and so on. He is a senior member of the IEEE, and Fellow of the IET.

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China Standard Time (CST) UTC/GMT+08:00

Sino-Australia Advanced Technology of Service Computing

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Zoom ID: 880 0896 9731 (Room 4)
https://us02web.zoom.us/j/88008969731

Time	#ID	Info.
13:30-13:45	Chair	Brief Introduction of the Panel
13:45-14:15	Panelist 1	Services at the Edge - Resources, Security and Intelligence **Qiang He, Swinburne University of Technology**
14:15-14:45	Panelist 2	Fog Engineering for Smart UAV Delivery System **Xiao Liu, Deakin University**
14:45-15:15	Panelist 3	Real-time Internet of Things: Architecture, Algorithms and Applications **Jiong Jin, Swinburne University of Technology**
15:15-15:25		Break
15:25-15:55	Panelist 4	Efficient and Continual Federated Meta-Learning under Data and System Heterogeneity **Ju Ren, Tsinghua University**
15:55-16:25	Panelist 5	Cloud-Edge Collaboration and Edge Intelligence in the 5G Era **Xiaofei Wang, Tianjin University**
16:25-16:55	Panelist 6	The Development Trend toward Cloud Native Edge Computing: Vision and Challenges **Deze Zeng, China University of Geosciences (Wuhan)**
16:55-17:00		Panel Discussion

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MAY 14, 2022

China Standard Time (CST) UTC/GMT+08:00

Sino-Australia Advanced Technology of Service Computing

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SPEECH TOPIC

Services at the Edge - Resources, Security and Intelligence
Qiang He, Swinburne University of Technology

Abstract: A lot of studies in the field of edge computing has focused on mobile network operators and mobile users' needs, e.g., computation offloading and edge server placement. App vendors, like Uber and YouTube, are also key players in edge computing, who hire computing resources at the network edge to serve their users. In this seminar, from app vendors' perspective, let us take a look at a series of challenges facing the app vendors at the edge in terms of resource, security and intelligence.

PANELIST BIO

Qiang He is currently an associate professor at Swinburne University of Technology, Australia. His major research interests include edge computing, service-oriented computing, cloud computing and software engineering. He has published 160+ papers at top venues, e.g., TSE, TMC, TPDS, TIFS, TDSC, TBD, TSC, TCC, WWW, IJCAI, ICDE, ICDM, ICSOC and ICWS, including 30+ CCF A papers and 60+ ACM/IEEE Transactions papers. He is the recipient of the Best Student Paper Award at ICWS2019, Best Student Paper Awards at SCC2018 and ICWS2017 and the Best Paper Award at ICSOC2018, as well as the Outstanding Research Award at Swinburne in 2018 and 2020. He is the Chief Investigator of three Discovery Projects funded by the Australian Research Council, and a Cooperative Research Project funded by the Commonwealth Scientific and Industrial Research Organisation.

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Sino-Australia Advanced Technology of Service Computing

Session Chairs | Qiang He, Swinburne University of Technology;
Shangguang Wang, Beijing University of Posts and Telecommunications

Zoom ID: 880 0896 9731 (Room 4)

https://us02web.zoom.us/j/88008969731

SPEECH TOPIC

Fog Engineering for Smart UAV Delivery System

Xiao Liu, Deakin University

Abstract: Fog/Edge computing has become the mainstream platform for smart IoT systems. In the meantime, UAV delivery has attracted a lot of attention in recent years as a promising solution to solve the last-mile delivery problem in smart logistics, especially under the current pandemic situation. However, there are still many open issues for engineering edge-based smart UAV delivery systems, such as computation offloading, edge intelligence, and security issues. In this talk, we will employ an edge-based smart UAV delivery system (named UAV-EXPRESS) as a typical example to introduce our recent studies on engineering edge-based smart systems including the simulation tool, the workflow execution engine, the blockchain based security framework, and the device-edge-cloud collaborative learning models.

PANELIST BIO
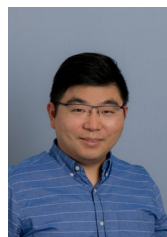
Xiao Liu received his Ph.D. degree in computer science and software engineering from the Faculty of Information and Communication Technologies, Swinburne University of Technology, Melbourne, Australia, in 2011. He was an Associate Professor at the Software Engineering Institute, East China Normal University, Shanghai, China, during 2013 to 2015. He is currently an Associate Professor and Associate Head of School (International) in the School of Information Technology, Deakin University, Melbourne, Australia. His research interests include workflow systems, cloud and edge computing, and human-centric software engineering. He has published many papers in world leading software engineering and service computing journals such as ACM ToSEM, IEEE TSE, IEEE TC, IEEE TSC, JSS, WWWJ, and also conferences such as ICSE, ASE, ICWS and ICSOC. He is a Senior Member of IEEE and ACM.

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China Standard Time (CST) UTC/GMT+08:00

Sino-Australia Advanced Technology of Service Computing

Session Chairs | Qiang He, Swinburne University of Technology;
Shangguang Wang, Beijing University of Posts and Telecommunications

Zoom ID: 880 0896 9731 (Room 4)

https://us02web.zoom.us/j/88008969731

SPEECH TOPIC

Real-time Internet of Things: Architecture, Algorithms and Applications

Jiong Jin, Swinburne University of Technology

Abstract: The Internet of Things (IoT) is an emerging revolution, which targets anytime connectivity for anything to create smart environments in which there is fast-paced interaction between systems (networked sensors, heterogeneous devices, actuators, robots) and between such systems and people. To further enable real-time services in IoT, a new fog/edge computing paradigm is recently introduced and explored in both academic and industrial fields. Its basic concept is to construct local fog nodes, which moves computation, control, networking, storage and security functionalities from traditional remote cloud right to a place closer to the end-users in order to optimally support time-critical applications. Meanwhile, it also empowers a new set of robotic applications to achieve real-time operations. In this talk, a complete overview and recent developments of real-time IoT will be presented with its applications in smart manufacturing, smart transport and smart cities.

PANELIST BIO

Jiong Jin received the B.E. degree with First Class Honours in Computer Engineering from Nanyang Technological University, Singapore, in 2006, and the Ph.D. degree in Electrical and Electronic Engineering from the University of Melbourne, Australia, in 2011. From 2011 to 2013, he was a Research Fellow in the Department of Electrical and Electronic Engineering at the University of Melbourne. He is currently an Associate Professor in the School of Science, Computing and Engineering Technologies, Swinburne University of Technology, Melbourne, Australia. His research interests include network design and optimization, edge computing and networking, robotics and automation, and cyber-physical systems and Internet of Things as well as their applications in smart manufacturing, smart transportation and smart cities. He was recognized as the 2022 AI 2000 Most Influential Scholars Honorable Mention in the field of Internet of Things (ranked no. 24 globally), and listed as the world Top 2% scientists for citation impact in 2021 by Elsevier.

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Sino-Australia Advanced Technology of Service Computing

Session Chairs | Qiang He, Swinburne University of Technology;
Shangguang Wang, Beijing University of Posts and Telecommunications

Zoom ID: 880 0896 9731 (Room 4)

https://us02web.zoom.us/j/88008969731

SPEECH TOPIC

Efficient and Continual Federated Meta-Learning under Data and System Heterogeneity

Ju Ren, Tsinghua University

Abstract: Federated learning (FL) enables distributed mobile devices to collaboratively learn a shared model without exposing their raw data, which mitigates the risk of privacy leakage and promotes mutual benefits between devices. However, the diverse data distribution among devices, i.e., data heterogeneity, usually results in significant performance degradation. The problem comes from that a globally shared model can hardly achieve the balance between personalization and generalization. To address this challenge, I will introduce our recent studies on federated meta-learning, where mobile devices can collaboratively learn a meta-model, aided by the knowledge transfer from prior tasks to keep personalization and continuous learning for local model. This talk will also bring several novel techniques we designed to conquer the challenges in deploying federated meta-learning on resource-constrained devices, including how to alleviate the computation burden, and how to jointly optimize client selection and communication resource allocation for fast model convergence.

PANELIST BIO

Ju Ren received the B.Sc. (2009), M.Sc. (2012), Ph.D. (2016) degrees all in computer science, from Central South University, China. Currently, he is an associate professor with the Department of Computer Science and Technology, Tsinghua University, China. His research interests include Internet-of-Things, edge computing, operating system, as well as security and privacy. He serves as an associate editor for IEEE Transactions on Vehicular Technology and Peer-to-Peer Networking and Applications, and served as the general co-chair for IEEE BigDataSE'20, the TPC co-chair for IEEE BigDataSE'19, a publicity chair for IEEE ICDCS'22, a poster co-chair for IEEE MASS'18, a track co-chair for IEEE/CIC ICCC'19, IEEE I-SPAN'18 and VTC'17 Fall, and an active reviewer for over 20 international journals. He received many best paper awards from IEEE flagship conferences, including IEEE ICC'19 and IEEE HPCC'19, etc., the IEEE TCSC Early Career Researcher Award (2019), and the IEEE ComSoc Asia-Pacific Best Young Researcher Award (2021). He is recognized as a highly cited researcher by Clarivate (2020 & 2021).

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Sino-Australia Advanced Technology of Service Computing

Session Chairs | Qiang He, Swinburne University of Technology;
Shangguang Wang, Beijing University of Posts and Telecommunications

Zoom ID: 880 0896 9731 (Room 4)

https://us02web.zoom.us/j/88008969731

SPEECH TOPIC

Cloud-Edge Collaboration and Edge Intelligence in the 5G Era

Xiaofei Wang, Tianjin University

Abstract: In the 5G era, the massive global IoT devices and the generated large amounts of data have put forward a brand new test for the traditional centralized cloud computing processing method. In order to provide more elastic, dynamic, reliable and even ubiquitous computing, storage, transmission and intelligent services, scientists and engineers are offloading some or even all of the application services to a large number of ubiquitous edge devices close to users, e.g., performing various services in edge clouds, edge gateways, etc. By this way, the service responsiveness is greatly improved, as well as the decrease of network bandwidth requirements. At the same time, through further collaboration between clouds and edges, AI service requirements, especially in complex scenarios, could also be efficiently supported, with the equitable resources allocation. Therefore, edge intelligence and cloud-edge collaboration will become the key technologies for the development of the smart industry and digital economy in the 5G era. Based on this background, this lecture will discuss from the perspectives of edge intelligence and intelligent edge, collaborative optimization of cloud-edge resources, edge multi-agent deep learning and optimization, as well as computing power network resource transaction and gaming.

PANELIST BIO

Xiaofei Wang [S'06, M'13, SM'18] (Senior Member, IEEE) received the B.S. degree from Huazhong University of Science and Technology, China, and got M.S. & Ph.D. degrees from Seoul National University, Seoul, South Korea. He was a Postdoctoral Fellow with The University of British Columbia, Vancouver, BC, Canada, from 2014 to 2016. He is currently a Professor with the Tianjin Key Laboratory of Advanced Networking, School of Computer Science and Technology, Tianjin University, Tianjin, China. Focusing on the research of edge computing, edge intelligence, and edge systems. He has authored more than 140 technical papers in publications such as IEEE JOURNAL ON SELECTED AREAS IN COMMUNICATIONS, IEEE TRANSACTIONS ON WIRELESS COMMUNICATIONS, IEEE WIRELESS COMMUNICATIONS, IEEE COMMUNICATIONS, IEEE TRANSACTIONS ON MULTIMEDIA, IEEE International Conference on Computer Communications, and IEEE International Conference on Sensing, Communication and Networking. Dr. Wang was the recipient of the "Scholarship for Excellent Foreign Students in IT Field" by NIPA of South Korea from 2008 to 2011, the "Global Outstanding Chinese Ph.D. Student Award" by the Ministry of Education of China in 2012, and the Peiyang Scholar from Tianjin University. In 2017, he was the recipient of the "Fred W. Ellersick Prize" from the IEEE Communication Society.

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Sino-Australia Advanced Technology of Service Computing

Session Chairs | Qiang He, Swinburne University of Technology;
Shangguang Wang, Beijing University of Posts and Telecommunications

Zoom ID: 880 0896 9731 (Room 4)

https://us02web.zoom.us/j/88008969731

SPEECH TOPIC

The Development Trend toward Cloud Native Edge Computing: Vision and Challenges

Deze Zeng, China University of Geosciences (Wuhan)

Abstract: Cloud native computing, mainly characterized by lightweight containers, is quite suitable for comparatively resource-constrained edge computing. Hence, it is promising to apply cloud native technologies to edge computing. Thus, it creates a new computing paradigm, i.e., cloud native edge computing (a.k.a., edge native computing). Although cloud native computing has already extensively studied in the cloud, when bringing it to the edge, there are still many challenges, mainly due to the low resource provision, vast resource distribution, high resource heterogeneity, etc. Therefore, it is significantly to optimize and adapt cloud native computing technologies for edge computing. In this talk, we will dive into some system architecture features of cloud native computing technologies (e.g., the layered structure of Docker images) and investigate how to exploit these features to optimize the resource allocation and task scheduling towards high efficient cloud native edge computing.

PANELIST BIO

Deze Zeng is currently a Full Professor in School of Computer Science, China University of Geosciences, Wuhan, China. He received his Ph.D. and M.S. degrees in computer science from University of Aizu, Aizu-Wakamatsu, Japan, in 2013 and 2009, respectively. He received his B.S. degree from School of Computer Science and Technology, Huazhong University of Science and Technology, China in 2007. His current research interests mainly focus on edge computing, and related technologies like network function virtualization, machine learning, and IoT. He has authored 3 books and over 100 papers in refereed journals and conferences in these areas. He also received 3 best paper awards from IEEE/ACM conferences and the IEEE Systems Journal Annual Best Paper Award of 2017 and 2019. He serves in editorial boards of IEEE Transactions on Sustainable Computing, Journal of Network and Computer Applications, Frontiers of Computer Science, and Open Journal of Computer Society, and guest editors of many prestigious journals/magazines. He has been the in organization or program committees of many international conferences including ICPADS, ICA3PP, CollaberateCom, MobiQuitous, ICC, Globecom. He is a member of IEEE, and senior member of CCF.

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China Standard Time (CST) UTC/GMT+08:00

Ph.D Symposium

Session Chair | Xiao Xue, Tianjin University

Zoom ID: 870 2542 0666 (Room 1)

https://us02web.zoom.us/j/87025420666

Panel Introduction: In this panel entitled "ICSS PhD Forum", we invite twelve excellent Ph.D candidates in the area of service computing to present their latest research progress. The topics of this panel include Open Service Platform, IoT Service Networks, Manufacturing Service Ecosystem, Serverless Computing, Cognitive Service, Services Collaboration, etc.

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Xiao Xue, Professor with the School of Computer Software, College of Intelligence and Computing, Tianjin University. His main research interests include service computing, computational experiment, crowd intelligence, etc. He actively participated in various academic activities, and served as the associate editor of International Journal of Crowd Science, the chairman of ICSOC 2021 Publicity; the chairman of NCSC 2021 General Track; the chairman of ICSOC 2019 Workshop; the PC member of ICWS, ICSOC, ICSS, NCSC and other academic conferences over the years. He has published more than 50 papers in top journals and conferences such as IEEE Trans, and won the ICWS 2020 Best Paper Award. The published book "Computational Experiment Methods for Complex Systems" is the first monograph on systematic research on computational experimental methods.

CCF 15th International Conference on SERVICE SCIENCE

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MAY 15 2022

China Standard Time (CST) UTC/GMT+08:00

Ph.D Symposium

Session Chair | Xiao Xue, Tianjin University

Zoom ID: 870 2542 0666 (Room 1)
https://us02web.zoom.us/j/87025420666

Time	#ID	Info.
13:30-13:45	Chair	Brief Introduction of the Panel
13:45-14:00	PhD#1	Tiansuan Constellation: An Open Research Platform **Qing Li, Beijing University of Posts and Telecommunications**
14:00-14:15	PhD#2	MemTrust: Find Deep Trust in Your Mind **Yanwei Xu, Tianjin University**
14:15-14:30	PhD#3	Specification-based Service Composition and Monitoring in Dynamic IoT Networks **Deng Zhao, China University of Geosciences (Beijing)**
14:30-14:45	PhD#4	Operational Framework and Dynamic Evolution Modeling of Service Ecosystem **Deyu Zhou, China University of Geosciences (Beijing)**
14:45-15:00	PhD#5	An Empirical Study on Challenges of Application Development in Serverless Computing **Jinfeng Wen, Peking University**
15:00-15:15	PhD#6	Challenges of User Understanding in Cognitive Service Bots **Bolin Zhang, Harbin Institute of Technology**
15:15-15:25		Break
15:25-15:40	PhD#7	Cost Optimization for Two-Tier Cloud Storage **Mingyu Liu, Shandong University**
15:40-15:55	PhD#8	Mobility-aware Offloading and Resource Allocation for Services Collaboration **Haowei Chen, Zhejiang University**
15:55-16:10	PhD#9	Software Services in Ethereum System **Mingxi Ye, Sun Yat-sen University**
16:10-16:25	PhD#10	SocialLGN: Light Graph Convolution Network for Social Recommendation **Jie Liao, Chongqing University**
16:25-16:40	PhD#11	SiamCorners: Siamese Corner Networks for Visual Tracking **Kai Yang, Harbin Institute of Technology, Shenzhen**
16:40-16:55	PhD#12	Crowd Counting by Using Top-k Relations: A Mixed Ground-Truth CNN Framework **Li Dong, Harbin Institute of Technology, Shenzhen**
16:55-17:00		Panel Discussion

Qing Li, Beijing University of Posts and Telecommunications

Biography: Qing Li received the M.S. degree from Xidian University in 2017. She is currently a Ph.D. candidate at the State Key Laboratory of Networking and Switching Technology, Beijing University of Posts and Telecommunications. Her research interests include cloud computing, edge computing.

Title of Speech: Tiansuan Constellation: An Open Research Platform

Abstract: Satellite network is the first step towards interstellar voyages. It can provide global Internet connectivity everywhere on the earth, where most areas cannot access the Internet by the terrestrial infrastructure. The space industry experiences a rise in large low-earth-orbit satellite constellations to achieve universal connectivity. The research community is also urgent to do some leading research to bridge the connectivity divide. Researchers now conduct their work by simulation, which is far from enough. However, experiments on real satellites are hindered by the exceptionally high bar of space technology, such as deployment cost and unknown risks. To solve the above challenges, we are eager to contribute to the universal connectivity and build an open research platform, Tiansuan constellation, to support experiments on real satellite networks. I will discuss the potential research topics that would benefit from Tiansuan. I will also introduce two case studies that have already been deployed in two experimental satellites of Tiansuan. I hope that more institutes and individuals interested in LEO satellites can join us in this exciting research area.

Yanwei Xu, Tianjin University

Biography: Yanwei Xu is currently pursuing the Ph.D. degree in College of Intelligence and Computing, Tianjin University, China. Her research interests include trust prediction in social networks, service recommendation and deep learning.

Title of Speech: MemTrust: Find Deep Trust in Your Mind

Abstract: Trust relations play a vital role in helping users quickly obtain reliable information and reduce the selection burden regarding decision-making. For example, the evidence suggests that users on the product review site *Epinions* are more likely to take advice from users they trust to decide on the products to buy. Trust typically refers to the expectation of trustor for the future behavior of trustee. Since the trustor is uncertain about the future behavior of the trustee, the trustor can only develop and evaluate expectations. Such expectations are formed with a view to the motivations of the trustee, dependent on their characteristics, the circumstances, and their interactions, which can be mined from the historical behavior records of the users. This means that the trust relations between users can be inferred from their historical behavior records. However, existing works on trust prediction mainly based on trust networks, usually give little consideration to data sparsity and temporal continuity of user behavior. To fill this gap, we propose a comprehensive deep MemTrust model for trust prediction.

Deng Zhao, China University of Geosciences (Beijing)

Biography: Deng Zhao is currently pursuing the Ph.D. degree in the School of Information Engineering, China University of Geosciences (Beijing), China. Her research interests include service computing, Internet of Things, and business process management. Email: dengzhao@cugb.edu.cn.

Title of Speech: Specification-based Service Composition and Monitoring in Dynamic IoT Networks

Abstract: The Internet of Things (IoT) has been widely deployed to support versatile applications, where an application can be satisfied by functionally compatible and non-functionally satisfiable IoT services. Considering the fact that the capacities of IoT devices may change dynamically, whether or not, and to what extent, certain IoT services can satisfy an application during the execution of a composition, are to be further explored. This observation motivates us to formalize interpretations of qualitative and quantitative satisfaction for prescribed constraints, and thus, to guarantee the compatibility of compositions with QoS variations. Runtime monitoring for constraint satisfaction of individual or composite IoT services is becoming essential in dynamic IoT networks. Taking advantages of formal methods like temporal logics, we can formulate service composition and monitoring as temporal tasks, and convert them to formal specifications. Qualitative and quantitative satisfaction degrees are formally interpreted at runtime. How current temporal logics can be appropriately applied in our scenarios, and whether they should be improved, are challenges faced by researchers.

Deyu Zhou, China University of Geosciences (Beijing)

Biography: Deyu Zhou is about to receive a master's degree in the School of Information Engineering, China University of Geosciences (Beijing). Her current research interests include service computing and computational experiment.

Title of Speech: Operational Framework and Dynamic Evolution Modeling of Service Ecosystem

Abstract: With the development of ICT (information and communications technology) and service economy, service ecosystem is emerging in a lot of fields, including E-commerce, O2O(Online To Offline) life service, healthcare service, cloud manufacturing, and so on. As a complex socio-technical system, the evolution of service ecosystem is the joint result of the interaction of the three heterogeneous networks, including social network, service network and value network. Sociality of the entity aggravates uncertainty and dynamics of service ecosystem. This poses new challenges to the analysis of service ecosystem's evolution. This report mainly focuses on the following points:(1) What are the problems faced by the service ecosystem evolution analysis? What are the disadvantages of traditional methods? (2) How to build an effective model for the operating mechanism of service ecosystem? How to build a model effectively of the complex social networks? (3) Taking the cloud manufacturing service ecosystem as an example, build a model to analyze the dynamic evolution of service ecosystem by computational experiments methods.

Jinfeng Wen, Peking University

Biography: Jinfeng Wen is currently a PhD student at the Software Engineering Institute, School of Computer Science, Peking University. She majors in Computer Software and Theory. She is supervised by Prof. Xuanzhe Liu. She received her BS and MS degrees from the Department of Computer Science and Technology, China University of Geosciences Beijing in 2017 and 2020, respectively. Her research interests include serverless computing and service computing.

Title of Speech: An Empirical Study on Challenges of Application Development in Serverless Computing

Abstract: Serverless computing is an emerging paradigm for cloud computing, gaining traction in a wide range of applications such as video processing and machine learning. This new paradigm allows developers to focus on the development of the logic of serverless computing based applications (abbreviated as serverless-based applications) in the granularity of function, thereby freeing developers from tedious and error-prone infrastructure management. Meanwhile, it also introduces new challenges on the design, implementation, and deployment of serverless-based applications, and current serverless computing platforms are far away from satisfactory. However, to the best of our knowledge, these challenges have not been well studied. To fill this knowledge gap, this paper presents the first comprehensive study on understanding the challenges in developing serverless-based applications from the developers' perspective. We mine and analyze 22,731 relevant questions from Stack Overflow (a popular Q&A website for developers), and show the increasing popularity trend and the high difficulty level of serverless computing for developers. Through manual inspection of 619 sampled questions, we construct a taxonomy of challenges that developers encounter, and report a series of findings and actionable implications. Stakeholders including application developers, researchers, and cloud providers can leverage these findings and implications to better understand and further explore the serverless computing paradigm.
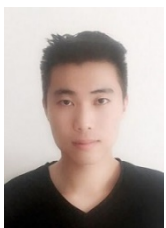
Bolin Zhang, Harbin Institute of Technology

Biography: Bolin Zhang received his M.S. degree from the School of Computer Science and Technology, Harbin Institute of Technology in 2021. He is currently pursuing the Ph.D. degree in software engineering at Harbin Institute of Technology (HIT), China. His research interests include cognitive service, user understanding, dialogue system and knowledge graph.

Title of Speech: Challenges of User Understanding in Cognitive Service Bots

Abstract: By using natural language, a more direct form of interaction, Cognitive Service Bots will play the "bridge" role between a user and massive services and improve the user oriented service delivery. However, user's utterance are complex and diverse, which makes it hard to understand the user's intention. This involves the following challenges: (1) Since user's intentions are sequentially correlated, how to plan this potential intents sequence in Requirements Elicitation? (2) During the conversation, user's requirement will change at any time and need be satisfied in multi-turn. How to help predict the user's next requirement by judging the completion of the current requirement? Moreover , user's intent is fuzzy or multiple in a single utterance. How to deal with it? (3) After user understanding, developers need to manually implement handler functions according to different intentions. There are so many public functional APIs that can be called, so matching utterance directly to APIs will greatly simplify development. However, supervised matching approaches for user understanding rely upon a large set of user utterances paired with API methods. How to generate utterances based on API Specifications automatically?

Mingyu Liu, Shandong University

Biography: Mingyu Liu received his B.S. degree from the School of Software, Shandong University in 2020. He is currently pursuing the Ph.D. degree in software engineering with the School of Software from Shandong University, Jinan, China. His research interests include cloud computing and service computing.

Title of Speech: Cost Optimization for Two-Tier Cloud Storage

Abstract: Storage-as-a-Service clouds generally offer both hot and cold storage tiers with different pricing options. Hot tiers provide a higher storage price but a lower access price, and vice versa for cold tiers. The pricing differences between hot and cold tiers bring an opportunity for cloud users to reduce their costs. For example, users can store infrequently accessed data in the cold tier and frequently accessed data in the hot tier and then dynamically migrate data between these two tiers for cost optimization. However, the strategy in the example requires the knowledge of future access patterns in advance which are difficult to predict precisely. With unknown future access patterns, inappropriate migrations will incur additional costs instead of cost savings. Therefore, how to cost-effectively migrate data between hot and cold tiers without any knowledge of the future is a challenge for cloud storage users to optimize costs and has attracted extensive attention from both industry and academia.

Haowei Chen, Zhejiang University

Biography: Haowei Chen received his B.S. degree from the School of Computer and Information Technology, Beijing Jiaotong University in 2020. He is currently working toward the Ph.D. degree in the College of Computer Science and Technology, Zhejiang University. His research interests include edge computing, service computing and distributed system.

Title of Speech: Mobility-aware Offloading and Resource Allocation for Services Collaboration

Abstract: Mobile edge computing is proposed to avert the inevitable burden by pushing computation capabilities from core to the edge of networks. It has emerged as a prominent paradigm to cope with the tremendous Internet data, where most of computation tasks are completed at edge servers in proximity through ratio access network (RAN), instead of the distant cloud. The status quo of striking tradeoff in terms of response latency and energy consumption motivates the study on task offloading and resource allocation. However, mobility of users and social relationships existing in collaboration present great challenges to speed up task completion while thwarting resource exhaustion. In this talk, we introduce an algorithm, named CSRAO, to get optimal offloading decision and allocation of CPU frequency and power for service collaboration with master-slave dependency among service chains of mobile users, with an objective to realize tradeoff between response latency and energy consumption.
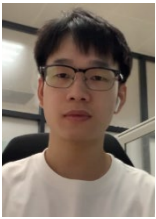
Mingxi Ye, Sun Yat-sen University

Biography: Mingxi Ye received his B.S. degree from the School of Mathematics, Sun Yat-sen University in 2021. He is currently a Ph.D. candidate, advised by Zibin Zheng. His research interests include program analysis, decentralized applications, fuzz testing.

Title of Speech: Software Services in Ethereum System

Abstract: With the increment of diversified decentralized applications and tremendous financial loss, security problems of software services in Ethereum system receive growing interest. The software services system can be divided into three parts, including the back-end, front-end, and links between them. The back-end of Ethereum services is Solidity smart contracts, which can be automatically run by miners. The front-end of Ethereum services are normally website, allowing users to invoke smart contracts in an easy-to-use way. The links between the front and back-end of Ethereum system are JSON-RPC APIs, transmitting requests from front-end to back-end services. These sophisticated services bring great challenges including: (1) smart contracts are vulnerable due to the decentralized characteristic brought by Ethereum, and developers who are unfamiliar with that feature write bugs like reentrancy. Attackers may profit from it; (2) the front-end of Ethereum services may collapse or run incorrectly due to various user input, which bring unnecessary losses to users; (3) blockchain node providers run Ethereum clients locally to transmitting requests, and the collapse of these services brings disaster to the reliability of Ethereum services.

Jie Liao, Chongqing University

Biography: Jie Liao received his B.S. degree from the College of Mathematics and Statistics, Chongqing University in 2020. He is currently pursuing the Ph.D. degree in School of Big Data and Software Engineering, Chongqing University, China. His research interests include recommender system, graph neural network and contrastive learning.

Title of Speech: SocialLGN: Light Graph Convolution Network for Social Recommendation

Abstract: Graph Neural Networks have been applied in recommender systems to learn the representation of users and items from a user-item graph. In the state-of-the-art, there are two major challenges in applying Graph Neural Networks to social recommendation: (i) how to accurately learn the representation of users and items from the user-item interaction graph and social graph, and (ii) based on the fact that each user is represented simultaneously by the two graphs, how to integrate the user representations learned from these two graphs. Aiming at addressing these challenges, this paper proposes a new social recommendation system called SocialLGN.

Kai Yang, Harbin Institute of Technology, Shenzhen

Biography: Kai Yang received the M.S. degree from Yunnan Minzu University in 2018. He is currently a Ph.D. candidate at the Research Center for Big Data Technology, Harbin Institute of Technology, Shenzhen. His research interests include deep learning, machine learning and visual tracking.

Title of Speech: SiamCorners: Siamese Corner Networks for Visual Tracking

Abstract: The current Siamese network based on region proposal network (RPN) has attracted great attention in visual tracking due to its excellent accuracy and high efficiency. However, the design of the RPN involves the selection of the number, scale, and aspect ratios of anchor boxes, which will affect the applicability and convenience of the model. Furthermore, these anchor boxes require complicated calculations, such as calculating their intersection-over-union (IoU) with ground truth bounding boxes. Due to the problems related to anchor boxes, we propose a simple yet effective anchor-free tracker (named Siamese corner networks, SiamCorners), which is end-to-end trained offline on large-scale image pairs. Specifically, we introduce a modified corner pooling layer to convert the bounding box estimate of the target into a pair of corner predictions (the bottom-right and the top-left corners). By tracking a target as a pair of corners, we avoid the need to design the anchor boxes. This will make the entire tracking algorithm more flexible and simple than anchor-based trackers. In our network design, we further introduce a layer-wise feature aggregation strategy that enables the corner pooling module to predict multiple corners for a tracking target in deep networks. We then introduce a new penalty term that is used to select an optimal tracking box in these candidate corners. Finally, SiamCorners achieves experimental results that are comparable to the state-of-art tracker while maintaining a high running speed. In particular, SiamCorners achieves a 53.7% AUC on NFS30 and a 61.4% AUC on UAV123, while still running at 42 frames per second (FPS).

Li Dong, Harbin Institute of Technology, Shenzhen

Biography: Li Dong received the M.S. degree from Harbin Institute of Technology in 2011. She is currently a Ph.D. candidate at the Research Center for Big Data Technology, Harbin Institute of Technology, Shenzhen. Her research interests include computer vision, crowd counting.

Title of Speech: Crowd Counting by Using Top-k Relations: A Mixed Ground-Truth CNN Framework

Abstract: Crowd counting as a fundamental task of crowd analysis, has attracted increasing attention in the deep learning community. The aim of crowd counting is to estimate the number of people in a given image in which each person is usually annotated by a point. I will introduce a top-k relations-based network (TKRNet), which is a mixed ground-truth convolutional neural network framework for crowd counting. Specifically, the estimated density maps generated in a coarse-to-fine manner are treated as coarse locations for crowds so as to assist TKRNet to regress the scattered point-annotated ground truth. Moreover, a top-k relation module (TKRM) is proposed to enhance feature representations by leveraging the top-k dependencies among pixels. Specifically, we first compute the similarity between two pixels so as to select the top-k relations for each position. Then, a weight normalization operation with an adaptive filter is proposed to make the TKRM adaptively eliminate the influence from the low correlation positions. Finally, a weight attention mechanism is introduced to make the TKRM pay more attention to the positions with high weights in the top-k relations. Extensive experimental results demonstrate the effectiveness of our proposed TKRNet on several public datasets in comparison to state-of-the-art methods.

- INVITED SESSION 1 -

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| MAY 14, 2022 | China Standard Time (CST) UTC/GMT+08:00 |

Research on Service Ecosystem and Its Evolution

Session Chairs | Keman Huang, Renmin University; Jian Wang, Wuhan University;
Zhiying Tu, Harbin Institute of Technology; Shizhan Chen, Tianjin University

Zoom ID: 870 2542 0666 (Room 1)
https://us02web.zoom.us/j/87025420666

Time	#ID	Info.
10:45-11:00	#56	**Congestion Detection and Link Control via Feedback in RDMA Transmission** Tianshi Wang, Hongwei Kan, Qibo Sun, Shan Xiao and Shangguang Wang
11:00-11:15	#1	**A Non-standardized Chinese Express Delivery Address Identification Model Based on Enhanced Representation** Zi Ye, Fanchao Meng, Bo Cao and Dianhui Chu
11:15-11:30	#4	**An Open-source Repository Retrieval Service Using Functional Semantics for Software Developers** Jiawei Wu, Yanchun Sun and Jiaqi Zhang
11:30-11:45	#8	**The Processing Method of the Message Based on the In-band Network Telemetry Technology** Congcong Min, Dongcheng Zhao and Hua Lu
11:45-12:00	#60	**A Study on Sentiment Analysis for Smart Tourism** Zhiwei Ma, Chunyang Ye and Hui Zhou

- INVITED SESSION 2 -

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MAY 14, 2022

China Standard Time (CST) UTC/GMT+08:00

Blockchain Technology and Applications

Session Chair | Ru Li, Inner Mongolia University

Zoom ID: 859 8085 1580 (Room 2)

https://us02web.zoom.us/j/85980851580

Time	#ID	Info.
10:45-11:00	#6	**Ring-Overlap: A Storage Scaling Mechanism Based on Consortium Blockchain** Wenxuan Liu, Donghong Zhang and Jindong Zhao
11:00-11:15	#50	**Security Evaluation of Smart Contracts based on Code and Transaction - A survey** Jianzhong Su, Jiyi Liu, Yuhong Nan and Yin Li
11:15-11:30	#10	**Incentive Design for Federated Learning Empowered Vehicular Crowdsourcing Blockchain** Xinran Ma, Shulin Sun, Zehua Liu and Lijun Sun
11:30-11:45	#45	**Fast Probabilistic Consensus Protocol (FPC) under Different Network Topologies** Fu Chen, Huizhu Li, Zhiyuan Sui, Kun Liu and Wenying Tang
11:45~12:00		Discussion

- INVITED SESSION 3 -

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MAY 15, 2022

China Standard Time (CST) UTC/GMT+08:00

Service-Based Integration of IoT and Business Processes

Session Chairs | Yanbo Han, North China University of Technology; Liang Zhang, Fudan University;
Jian Yu, Auckland University of Technology

Zoom ID: 859 8085 1580 (Room 2)
https://us02web.zoom.us/j/85980851580

Time	#ID	Info.
14:00-14:30	#14	**A Short Survey on Inductive Biased Graph Neural Networks** Yuqi Zhang, Nancy Wang, Jian Yu, Sira Yongchareon and Mo Nguyen
14:30-15:00	#19	**Service-Based Event Penetration from IoT Sensors to Businesses: a Case Study** Guiling Wang, Jun Fang, Jing Wang, Jian Yu, Liang Zhang and Yanbo Han
15:00-15:30	#34	**On the Uncertainty in IoT-enabled Business Processes using Artificial Intelligence Components** Marc Hesenius, Nils Schwenzfeier, Ole Meyer and Volker Gruhn
15:30-16:00	#43	**IoTDM4BPMN: An IoT-Enhanced Decision Making Framework for BPMN 2.0** Yusuf Kirikkayis, Florian Gallik and Manfred Reichert
16:00-16:30	#53	**Modeling, Executing and Monitoring IoT-Aware Processes with BPM Technology** Florian Gallik, Yusuf Kirikkayis and Manfred Reichert
16:30-17:00	#59	**Generalizing STNU to Model Non-functional Constraints for Business Processes** Jun Peng, Jingwei Zhu and Liang Zhang

- INVITED SESSION 4 -

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MAY 15, 2022

China Standard Time (CST) UTC/GMT+08:00

Technologies for Computing Force Network Service

Session Chairs | Tao Sun, China Mobile;
Hongwei Kan, Inspur

Zoom ID: 834 9183 6227 (Room 3)
https://us02web.zoom.us/j/83491836227

Time	#ID	Info.
13:30-13:45	#7	**Multifunctional Module Design Based on Hybrid CMOS-Memristor Logic Circuit** Chao Ji, Tuo Li and Xiaofeng Zou
13:45-14:00	#11	**Multi-Granularity Decomposition based Task Scheduling for Migration Cost Minimization** Ziliang Wang, Tingting Zhang, Ying Li, Sheng Wang, Fanqing Zhou, Lei Feng and Wenjing Li
14:00-14:15	#16	**Service Information Informing in Computing Aware Networking** Zongpeng Du, Zhiqiang Li, Jing Wang and Xiaodong Duan
14:15-14:30	#17	**Mobile Computing Force Network (MCFN) Computing and Network Convergence Supporting Integrated Communication Service** Xiaonan Shi, Qin Li, Dan Wang and Lu Lu
14:30-14:45	#18	**A computing-aware routing protocol for Computing Force Network** Huijuan Yao, Lu Lu, Xiaodong Duan and Yuexia Fu
14:45-15:00	#31	**Base Station Computing Force Resource Load Balancing Strategy for Distributed Machine Learning** Mingkang Song, Mengke Yao, Jianming Zhou, Tenghui Ke, Peng Dai, Xiaobin Wang and Weidong Li
15:00-15:15	#46	**Optimization of Service Scheduling in Computing Force Networks** Yongqiang Dong, Chenchen Guan, Yunli Chen, Kun Gao, Lu Lu and Yuexia Fu
15:15-17:00		Discussion

- PAPER SESSION 1 -

China Standard Time (CST) UTC/GMT+08:00

Service Scheduling and Management

Session Chair | Pengcheng Zhang, Hohai University

Zoom ID: 834 9183 6227 (Room 3)

https://us02web.zoom.us/j/83491836227

Time	#ID	Info.
10:45-11:00	#35	**Overbooking-enabled Virtual Machine Deployment Approach in Mobile Edge Computing** Bingyi Hu, Jixun Gao and Jialei Liu
11:00-11:15	#44	**Cache Replacement Algorithm Based on Dynamic Constraints in Microservice Platform** Liwen Li, Chunyang Ye and Hui Zhou
11:15-11:30	#49	**SUAM: A Service Unified Access Model for Microservice Management** Yu Jiang, Chengkai Li and Ying Li
11:30-11:45	#55	**Task-role Performance Evaluation via Business Process Monitoring with BPMN Extension** Hangyu Cheng, Guosheng Kang, Jianxun Liu, Yiping Wen, Buqing Cao and Bowen Liang
11:45-12:00	#70	**eBPF-based Working Set Size Estimation in Memory Management** Zhilu Lian, Yangzi Li, Zhixiang Chen, Shiwen Shan, Baoxin Han and Yuxin Su

- PAPER SESSION 2 -

China Standard Time (CST) UTC/GMT+08:00

Service Recommendation and Prediction

Session Chair | Jian Wang, Wuhan University

Zoom ID: 880 0896 9731 (Room 4)

https://us02web.zoom.us/j/88008969731

Time	#ID	Info.
10:45-11:00	#5	**A Novel Science and Technology Resource Recommendation Service based on Knowledge Graph and Collaborative Filtering** Xinyu Zhao, Chen Liu, Shuo Zhang and Xin You
11:00-11:15	#29	**HRET: Heterogeneous Information Network for Recommendation in Testing and Inspection** Liwen Zhang, Weiping Li, Tong Mo and Weijie Chu
11:15-11:30	#36	**MRNN-SA: A Multi-dimensional Time Series Fault Prediction Service for Power Equipment through Self-attention** Mengda Xing, Yongyan Yang, Tao Chen, Jinghong Sun, Fan Pang, Hongwei Zhang, Weilong Ding and Han Li
11:30-11:45	#58	**A Process Evaluation Method for Crossover Service Recommendation** Yushuang Fang, Min Yuan, Hangrui Zhang and Ruzhen Wang
11:45-12:00	#73	**DDAPI: A Deep Diverse API Sequence Recommendation Framework with Long-tail Items** Siyu Nan, Bing Li, Jian Wang and Duantengchuan Li

- PAPER SESSION 3 -

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MAY 15, 2022

China Standard Time (CST) UTC/GMT+08:00

AI-Inspired Services

Session Chair | Liang Chen, Sun Yet-sen University

Zoom ID: 870 2542 0666 (Room 1)

https://us02web.zoom.us/j/87025420666

Time	#ID	Info.
10:30-10:45	#9	**A Machine Learning Method and Device Based on Programmable Switch** Congcong Min, Dongcheng Zhao and Hua Lu
10:45-11:00	#30	**Improve the Performance of CenterNet through Hybrid Attention Mechanism CBAM** Tianyang Li, Tibing Zhang, Jian Wang, Zhongjie Wang, Ting He and Yufeng Zhang
11:00-11:15	#32	**Distributed Machine Learning Based Link Allocation Strategy** Yi Yang, Mingkang Song, Jianming Zhou, Peng Dai, Tenghui Ke, Weidong Li, Zhengguang Wu and Xiayan Zheng
11:15-11:30	#62	**Game Difficulty Prediction Algorithm based on Improved Monte Carlo Tree** Boqin Hu and Fu Chen
11:30-11:45	#72	**A Graph Neural Network-based Code Recommendation Method for Smart Contract Development** Xiuwen Tang, Jiazhen Gan and Zigui Jiang
11:45~12:00		Discussion

- PAPER SESSION 4 -

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MAY 15, 2022

China Standard Time (CST) UTC/GMT+08:00

Data-based Services

Session Chair | Li Kuang, Central South University

Zoom ID: 859 8085 1580 (Room 2)

https://us02web.zoom.us/j/85980851580

Time	#ID	Info.
10:30-10:45	#12	**A DTP and SoLiD based Service for Multi-Source Semantically-Heterogeneous Personal Data Management** Zhenxiang Zhao, Chao Ma, Haochen Yuan and Zhongjie Wang
10:45-11:00	#13	**A Smart Contract-based Service Platform for Trustworthy Crowd Funding and Crowd Innovation** Wenjie Teng, Hanchuan Xu, Yu Bai, Zhe Huang and Zhongjie Wang
11:00-11:15	#38	**Identifying Prerequisite Relations between Concepts in Wikipedia** Kui Xiao, Yuming Fu, Ying Deng and Lingmei Xia
11:15-11:30	#41	**Medical Service Oriented Blockchain Data Credibility Evaluation Method** Meng Wang, Rong Jiang, Yue Yang, Chenguang Wang, Lin Zhang, Liang Yang and Xuetao Pu
11:30~12:00		Discussion

- PAPER SESSION 5 -

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MAY 15, 2022

China Standard Time (CST) UTC/GMT+08:00

Service Security and Privacy

Session Chair | Yueshen Xu, Xidian University

Zoom ID: 834 9183 6227 (Room 3)
https://us02web.zoom.us/j/83491836227

Time	#ID	Info.
10:30-10:45	#61	**Threat Identification Model for Suspected Internet of Things Attack Groups** Rui Yu, Fu Chen, Wenmao Liu and Hong-qing Sang
10:45-11:00	#68	**FSC: File Storage in Coded Blockchain with C-PBFT Consensus Protocol** Ruize Yu, Changlin Yang and Ying Liu
11:00-11:15	#71	**Probing the Mystery of Cryptocurrency Exchange: The Case Study Based on Mt.Gox** Yuanjun Ding and Weili Chen
11:15-11:30	#74	**Differentially Private Auction for Federated Learning with Non-IID Data** Kean Ren
11:30~12:00		Discussion

- Final Session -

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MAY 15, 2022

China Standard Time (CST) UTC/GMT+08:00

Awards & Closing

Session Chair | Shangguang Wang, Beijing University of Posts and Telecommunications

Zoom ID: 870 2542 0666 (Room 1)

https://us02web.zoom.us/j/87025420666

- 17:00-17:30 -

Awards Announcement

Jianwei Yin, Zhejiang University, China

Message of CCF ICSS 2023 Organizer

Hanchuan Xu, Harbin Institute of Technology, China

CCF ICSS 2022 Summarization

Zhongjie Wang, Harbin Institute of Technology, China

CCF 15th International Conference on
SERVICE SCIENCE

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Wuhui Chen

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