

The Hyper-Intelligence Congress 2021

The 23rd IEEE International Conference on High Performance Computing and Communications (HPCC 2021)

The 19th IEEE International Conference on Smart City (SmartCity 2021)

The 7th IEEE International Conference on Data Science and Systems (DSS 2021)

The 7th IEEE International Conference on Dependability in Sensor, Cloud and Big Data Systems and Applications (DependSys 2021)

The 16th International Conference on Green, Pervasive, and Cloud Computing (GPC 2021)

The 2021 IEEE International Conference on Data, Information, Knowledge and Wisdom (DIKW 2021)

December 20-22, 2021, Haikou, Hainan

<http://www.ieee-cybermatics.org/2021/hpcc/>
Conference Program and Information Booklet



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Presentation Guidelines

Conference Date

The conference is to be held from Dec 20-22, 2021. The time for conference program is based on CST, China Standard Time.

Language

The presentation language of the IEEE HPCC/SmartCity/DSS/DependSys/GPC/DIKW-2021 and associated workshops is English.

For Session Chairs

Session Chairs are requested to join the physical room or online zoom at least 10 minutes before their sessions.

For Authors

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

Timing

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

It is recommended that all IEEE HPCC/SmartCity/DSS/DependSys/GPC/DIKW-2021 presentations use **10-20 minutes presentation time plus 5 minutes question time**. However, the Session Chairs will determine the exact presentation time for each paper, based on the number of presentations in each session. The Session Chairs will ensure that you do not over-run the time allocated.

Proceedings

If you are interested in reading papers during the presentations, here are the proceedings:

<https://conferences.computer.org/hpccpub>

The username and password will be sent to all fully registered participants separately.

Online Conference Venue

Besides six physical rooms, the following zoom/room links are for online conference presentation. You can enter any zoom/room that you are interested in via the links:

Keynote (Zoom URL): <https://zoom.us/j/98749187745?pwd=QisxWEZQRjUxNTdMeTFwMVZBS0g1UT09>

ID: 987 4918 7745; Password: 786336

地点: 2021 年 12 月 20 日主会场在**一楼海口宴会厅**

Room 1: Physical presentation (Tencent meeting room)
ID:411-1878-3325,密码: 111999
Room 2: Physical presentation (Tencent meeting)
ID:852-4336-1235, 密码: 111111
Room 3: Physical presentation (Tencent meeting room)
ID:565-5722-6135,密码: 1111
Room 4: Physical presentation (Tencent meeting room)
ID:636-1483-1361, 密码: 159357
Room 5: Physical presentation (Tencent meeting room)
ID:567-9273-3526,密码: 101386
Room 6: Physical presentation (Tencent meeting room)
ID:768-7435-1076,密码: 112345
Room 7: Online presentation (Zoom URL)
<https://zoom.us/j/98749187745?pwd=QisxWEZQRjUxNTdMeTFwMVZBS0g1UT09>
ID: 987 4918 7745; Password: 786336

12 月 21-22 日各分会的地点分布图	
Room 1	三亚 A 厅(一楼)
Room 2	三亚 B 厅(一楼)
Room 3	博鳌厅(一楼)
Room 4	文昌厅(二楼)
Room 5	峨眉山包厢(二楼)
Room 6	武夷山包厢(二楼)
Room 7	办公室会议厅(园区内)

Welcome Message from the Congress Chair

Welcome to the Hyper-Intelligence Congress 2021 which includes the 23rd IEEE International Conference on High Performance Computing and Communications (HPCC-2021); the 19th IEEE International Conference on Smart City (SmartCity-2021); the 7th IEEE International Conference on Data Science and Systems (DSS-2021); the 7th IEEE International Conference on Dependability in Sensor, Cloud and Big Data Systems and Applications (DependSys-2021); the 16th International Conference on Green, Pervasive, and Cloud Computing (GPC-2021); the 2021 IEEE International Conference on Data, Information, Knowledge and Wisdom (DIKW-2021).

Hyper-Intelligence refers to higher, super-intelligent abilities to accomplish complex tasks. For instance, hyper-intelligent humans are individuals gifted with extraordinary intellectual aptitudes and are capable of solving the world's most challenging problems. Hyper-Intelligence is an inter-disciplinary field that studies hyper-connections, hyper-compositions, and hyper-collaborations of intelligent entities in various forms and functions that can be physical or digital, local or remote. The Hyper-Intelligence Congress 2021 covers a multitude of application domains such as high performance computing and communications, smart city, data science and systems, dependability in sensors, cloud and big data systems and applications, green computing, data wisdom, etc. The Congress will usher in a new age of cyber-physical-social-human interactions, revolutionizing and reshaping the world as we know it.

Here we would like to sincerely thank all organizing committee members, program committee members and reviewers for their hard work and valuable contribution. Without your help, these conferences would not have been possible. We greatly appreciate the sponsorship from IEEE, IEEE Computer Society, IEEE CIS Cyber-Physical-Social Systems Task Force, IEEE Technical Committee on Scalable Computing (TCSC), and IEEE SC Hyper-Intelligence Technical Committee (HI-TC). We are very grateful to the keynote speakers for their authoritative speeches. We thank all authors and conference participants for using this forum to communicate their excellent work.

The conferences were planned to be held in Haikou, December 20-22, 2021. Given the COVID-19 pandemic and associated travel restrictions, as the safety of people is of the highest priority, the conferences were held physically and virtually on December 20-22, 2021 accordingly.

We hope you find the conferences a stimulating and exciting forum.



Laurence T. Yang, Vice President and Dean
FCAE, FEIC, MAE, FIEEEE, FIET
Chair, IEEE CS Technical Committee on Scalable Computing
Chair, IEEE SMC Technical Committee on Cybermatics
Chair, IEEE SC Hyper-Intelligence Technical Committee
Hainan University, China
Congress Steering Chair

Congress Keynotes

Keynote 1: Linfu Sun, Southwest Jiaotong University, China

IT/OT Fusion and Next Generation Industrial Software

Keynote 2: Steve Chen, 3rd Brain Research Institute, USA

Advanced Applications of Brain Science + AI + Grid Edge Supercomputing

Keynote 3: Yuguang “Michael” Fang, University of Florida, USA

Beef Up the Edge: Building a Service Network for Sensing, Communications, Computing, Storage and Intelligence at the Edge

Keynote 4: Wayne Dai, VeriSilicon, China

AI Everywhere: From Cloud Computing to Edge Computing

Keynote 5: Deqing Zou, Huazhong University of Science and Technology, China

Deep Learning-Based Vulnerability Detection for Open-Source Software

Keynote 6: Schahram Dustdar, Vienna Technical University, Austria

Edge Intelligence – Engineering the New Fabric of IoT, Edge, and Cloud

Keynote 7: Gang Xia, CEC Industrial Internet, China

Practice and Exploration of Industry and Finance Platform Based on the IoT

Keynote 8: Jinzhou Yang, China Unicom, China

5G-Lead, Data & Intelligence-Driven, Digital Twins Shape the New Pattern of Smart City

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Keynote 1: IT/OT Fusion and Next Generation Industrial Software

Linfu Sun, Southwest Jiaotong University, China

About the Keynote Speaker



Linfu Sun, the chair professor of Southwest Jiaotong University, is a member of the 10th, 11th and 12th CPPCC National Committee respectively. He is a talent of the National High-level Talent Special Support Program and the head of the “Cloud Service Platform Technology Innovation Team” sponsored by the Ministry of Science and Technology of China (MOST). He is the chair of the expert committees “Network Collaborative Manufacturing and Smart Factory” and “Industrial Software” of MOST National Key Research and Development Program. He is also a member of the National Industrial Internet Strategy Advisory Expert Committee.

Summary: Based on the information technology and operational technology convergence for the next generation of digital industrial software, Dr. Sun will discuss current topical issues and key challenges correspondingly. Dr. Sun will also conclude with a summary of future trends and goals in the field of industrial software.

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Keynote 2: Advanced Applications of Brain Science + AI + Grid Edge Supercomputing

Steve Chen, 3rd Brain Research Institute, USA

About the Keynote Speaker



Dr. Steve Chen, Member of US National Academy of Engineering, Member of American Academy of Arts and Sciences, Founder and CEO of the 3rd Brain Research Institute in the United States, is a world-renowned supercomputer expert. He has developed the world's first parallel vector supercomputer for scientific research and industrial applications. Dr. Chen also developed the world's first high-density blade supercomputer with 128 blades, and the first Internet-based, application-to-application, high efficiency, dynamic enterprise collaborative software TONBU. He has also developed the world's first Information Super-grid SCP architecture based on supercomputers global network similar to the power grid. He specializes in cutting-edge research and development, and now is focusing on Research the brain, Protect the brain, Develop the brain, and Extend the brain.

Summary: Based on the 5G+ Industrial Internet + Big data + Brain Science +Intelligent supercomputing technologies, Dr. Chen will present his product/project plans in the emerging and advanced digital applications of Healthcare, Education, Agriculture, Energy, Culture/Entertainment and Finance areas.

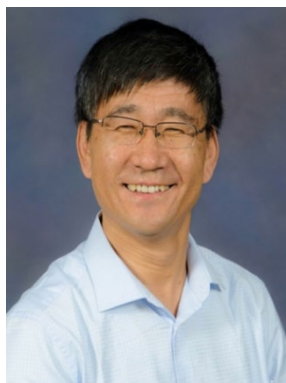
Dr. Chen will also present his science and technology-based project plans in the demonstration of achieving Chinese National Goals of Rural Revitalization and Carbon Neuralization.

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Keynote 3: Beef Up the Edge: Building a Service Network for Sensing, Communications, Computing, Storage and Intelligence at the Edge

Yuguang "Michael" Fang, University of Florida, USA

About the Keynote Speaker



Dr. Yuguang "Michael" Fang received MS degree from Qufu Normal University, Shandong, China in 1987, PhD degree in Systems and Control Engineering from Case Western Reserve University in 1994 and PhD degree in Electrical and Computing Engineering from Boston University in 1997. He was an assistant professor in the Department of Electrical and Computer Engineering at New Jersey Institute of Technology from 1998 to 2000. He then joined the Department of Electrical and Computer Engineering at University of Florida in 2000 as an assistant professor, then was promoted to an associate professor in 2003 and a full professor in 2005, and has been a distinguished professor since 2019. He holds University of Florida Preeminence Term Professorship (2019-2022), University of Florida Research Foundation (UFRF) Professorship (2006-2009, 2017-2020), and University of Florida Term Professorship (2017-2019, 2019-2021).

Dr. Fang received the US National Science Foundation Career Award in 2001 and the Office of Naval Research Young Investigator Award in 2002, 2018 IEEE Vehicular Technology Outstanding Service Award, 2019 Communications Society AHSN Technical Achievement Award, 2015 IEEE Communications Society CISTC Technical Recognition Award, 2014 IEEE Communications Society WTC Recognition Award, and multiple Best Paper Awards from IEEE Globecom (2015, 2011 and 2002) and IEEE ICNP (2006). He has also received the 2019 ECE Faculty Excellence Award in Research, 2010-2011 UF Doctoral Dissertation Advisor/Mentoring Award, and the 2009 UF College of Engineering Faculty Mentoring Award. He served as the Editor-in-Chief of IEEE Transactions on Vehicular Technology (2013-2017) and IEEE Wireless Communications (2009-2012), and serves/served on several editorial boards of journals including the Proceedings of the IEEE (2018-present), ACM Computing Surveys (2017-present), IEEE Transactions on Mobile Computing (2003-2008, 2011-2016), IEEE Transactions on Communications (2000-2011), and IEEE Transactions on Wireless Communications (2002-2009). He has been actively participating in conference organizations such as serving as the Technical Program Co-Chair for IEEE INFOCOM'2014 and the Technical Program Vice-Chair for IEEE INFOCOM'2005. He is the Director of Magazines of IEEE Communications Society and a Distinguished Speaker of IEEE Vehicular Technology. He is a fellow of the IEEE (2008) and a fellow of the American Association for the Advancement of Science (AAAS) (2015).

Summary: Sensing collects data for information, communications transports data for spot data consumption, computing enables data processing and intelligence extraction for decision making and control, while storage provides flexible buffering for optimal scheduling and content distribution, all together providing services for better quality of life. We observe an emerging paradigm shift: network technology is no longer just for message exchanges, rather becomes a utility as the consequence of the convergence of sensing, communications, computing, storage and intelligence (SCCSI), pushing needed services closer to the customers. In this talk, the speaker will present his view on how to put all pieces together and beef up the edge to intelligitize the life dependable systems.

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Keynote 4: AI Everywhere: From Cloud Computing to Edge Computing

Wayne Dai, VeriSilicon, China

About the Keynote Speaker



Dr. Wayne Dai founded VeriSilicon in August 2001 and has been the chairman, president and chief executive officer of the company. Dr. Dai received a bachelor's degree in computer science and a doctorate in electronic engineering from the University of California, Berkeley, and was a professor in the Department of Computer Engineering at the University of California, Santa Cruz.

Dr. Dai is the founding chairman of the World Association of Electronic Engineers International Conference on Multi-chip Modules, the founding chairman of the World Association of Electronic Engineers Seminar on Integrated Design of Chip Packaging, and the co-chair of the Program Committee of the 2010 International Green Energy Forum. He has served as the associate editor of the World Association of Electronics Engineers Circuit and System Papers Monthly and VLSI System Papers Monthly, and has published more than 100 papers in various technical journals and conferences. In 1990, he was awarded the US Presidential Youth Research Award. Dr. Dai was awarded the title of "Top 10 Entrepreneurs in China" in 2005 and was elected as "Top Ten Talents in Science and Technology in China in 2005". Best Manager Award, Hurun Report 2014 China Industry Contribution Award, 2018 Global Electronic Achievement Award for Asia-Pacific Innovative Person of the Year, "Shanghai Smart City Construction Leader" honorary title, 2019 Global Electronic Achievement Award for Outstanding Contributor of the Year prize. Currently, Dr. Dai serves as the vice chairman of the Global Innovation Center, the executive vice chairman of the International Alliance of Innovation and Technology, the vice chairman of the Integrated Circuit Design Branch of the China Semiconductor Industry Association, the chairman of the China RISC-V Industry Alliance, and a member of the Expert Committee of the Automotive Electronics Industry Alliance, Shanghai Deputy Director of the Expert Committee of the Municipal Integrated Circuit Industry Cluster Development Promotion Agency.

Summary: Approximately 80% of data are generated at the edge in 2030 compared to 20% in 2015. It is estimated that less than 2% of the data generated from IoT devices are used in 2020 and less than 0.5% will be used in 2030. AI computing is evolving from centralized cloud Server to Edge Servers to Edge Devices as distributed computing. Today, most machine learning algorithms are designed to be calculated in a single processor/device, so people are not taking advantage of all computational power in their house. There are many Open Source machine learning Algorithms available online, however, accurate, trained ML models are not public, datasets are not public and can contain sensitive customer data. Our vision is to build an Open, Creative, Secured AI Ecosystem. While cloud computing requires high performance, edge computing needs low power consumption. Compared with CPU, FPGA, and GPU, ASIC has great advantages in terms of computing efficiency, size, and cost. VeriSilicon provides platform-based, all-round, one-stop custom silicon services and semiconductor IP licensing.

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Keynote 5: Deep Learning-Based Vulnerability Detection for Open-Source Software

Deqing Zou, Huazhong University of Science and Technology, China

About the Keynote Speaker



Deqing Zou is a Professor and an Executive Dean in the School of Cyber Science and Engineering at Huazhong University of Science and Technology, Wuhan, China. His research interest lies in system security, trusted computing, virtualization and cloud security. He has received an Excellent Teacher of National Cyber Security and a Winner of Education Ministry's New Century Excellent Talents Program. He has co-authored four books and published over 100 refereed journal and conference papers in his research areas, including IEEE TDSC, IEEE TPDS, ACM TOSEM, NDSS, ASE, ASPLOS, etc. He has served as a reviewer for many prestigious journals such as IEEE TDSC, IEEE TOC, IEEE TPDS, and IEEE TCC. He has also served as PC chair/PC member of more than 40 international conferences.

Summary: The detection of software vulnerabilities is a significant problem that has yet to be tackled, as manifested by the many vulnerabilities reported on a daily basis. The wide reuse of open-source software and the increasing complexity of software supply-chains make the problem of detecting software vulnerabilities even more imperative. This talk will discuss our recent researches on deep learning-based vulnerability detection for open-source software, beginning with the first deep learning-based vulnerability detector for library/API-related vulnerabilities. Then this talk will present a multiclass deep learning-based vulnerability detector, a framework for deep learning-based vulnerability detection, and a fine-grained vulnerability detector for locating vulnerable statements. Finally, this talk will also discuss a practical method toward tackling the interpretability of the deep learning model in vulnerability detection.

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Keynote 6: Edge Intelligence – Engineering the New Fabric of IoT, Edge, and Cloud

Schahram Dustdar, Vienna Technical University, Austria

About the Keynote Speaker



Schahram Dustdar is a Full Professor of Computer Science, he is also the director of distributed Systems Research at the Vienna Technical University, heading the Research Division of Distributed Systems at the TU Wien, Austria. He has an H-index of 78 with some 36,000 citations. He holds several honorary positions: University of California (USC) Los Angeles; Monash University in Melbourne, Shanghai University, Macquarie University in Sydney, University Pompeu Fabra, Barcelona, Spain. From Dec 2016 until Jan 2017 he was a Visiting Professor at the University of Sevilla, Spain and from January until June 2017 he was a Visiting Professor at UC Berkeley, USA. From 1999 – 2007 he worked as the co-founder and chief scientist of Caramba Labs Software AG in Vienna (acquired by Engineering NetWorld AG), a venture capital co-funded software company focused on software for collaborative processes in teams. Caramba Labs was

nominated for several (international and national) awards: World Technology Award in the category of Software (2001); Top-Startup companies in Austria (CapGemini Ernst & Young) (2002); MERCUR Innovation award of the Austrian Chamber of Commerce (2002). He is founding co-Editor-in-Chief of ACM Transactions on Internet of Things (ACM TIoT) as well as Editor-in-Chief of Computing (Springer). He is an Associate Editor of IEEE Transactions on Services Computing, IEEE Transactions on Cloud Computing, ACM Computing Surveys, ACM Transactions on the Web, and ACM Transactions on Internet Technology, as well as on the editorial board of IEEE Internet Computing and IEEE Computer. Dustdar is recipient of multiple awards: IEEE TCSVC Outstanding Leadership Award (2018), IEEE TCSC Award for Excellence in Scalable Computing (2019), ACM Distinguished Scientist (2009), ACM Distinguished Speaker (2021), IBM Faculty Award (2012). He is an elected member of the Academia Europaea: The Academy of Europe, where he is chairman of the Informatics Section, as well as an IEEE Fellow (2016) and an Asia-Pacific Artificial Intelligence Association (AAIA) Fellow (2021).

Summary: As humans, things, software and AI continue to become the entangled fabric of distributed systems, systems engineers and researchers are facing novel challenges. In this talk, we analyze the role of IoT, Edge, Cloud, and Human-based Computing as well as AI in the co-evolution of distributed systems for the new decade. We identify challenges and discuss a roadmap that these new distributed systems have to address. We take a closer look at how a cyber-physical fabric will be complemented by AI operationalization to enable seamless end-to-end distributed systems.

The Hyper-Intelligence Congress 2021

Keynote 7: Practice and Exploration of Industry and Finance Platform Based on the IoT

Gang Xia, CEC Industrial Internet, China

About the Keynote Speaker



Dr. Gang Xia, born in Hangzhou, Zhejiang Province in 1975, graduated from the National University of Defense Technology with a PhD in Aircraft Design. He used to be a professor at the National University of Defense Technology, a visiting scholar at the School of Mechanical Engineering of the Technical University of Munich, Germany, now a researcher-level senior engineer of China Electronics Corporation, a member of the CEC group science and technology committee.

In 2018, Dr. Xia joined CEC Industrial Internet in Changsha, Hunan Province, a secondary enterprise of China Electronics Group, as the deputy general manager. In 2019, he concurrently served as Chairman of CEC FreundSchaft Technology Co., Ltd. in Fujian Province.

Dr. Gang Xia has made important contributions to the company's initial development after entering CEC Industrial Internet. Especially since he became the chairman of CEC FreundSchaft in 2019, he has actively promoted the implementation of intelligent manufacturing and industrial Internet in Fujian Province. The company's technological level has been continuously improved, and the intelligent manufacturing solutions have been improved in more than 100 factories. In 2019, the large-scale personalized customized solution for the footwear industry was awarded the Industrial Internet Innovative Application Solution of the Ministry of Industry and Information Technology. Out of the 1457 projects in the 2nd China Industrial Internet Competition organized by the Ministry of Industry and Information Technology in 2020, Dr. Xia won the second place in the newcomer group. In 2020, he was awarded the Science and Technology Talent Award (civilian category) of CEC Group. In April 2021, Gang Xia was rated as a provincial-level talent in Fujian Province's tens of millions of projects.

Summary: Nowadays, the Internet of Things (IoT) is a hot spot in the field of intelligent manufacturing. Many companies are joining the wave of entrepreneurship in IoT products, however, there are very few companies that are truly profitable, especially those that can obtain value-added services from the IoT industry for a long time. CEC Industrial Internet Platform, which names Bach OS, is an industrial Internet platform established by CEC group based on the PKS autonomous and controllable software and hardware system. Bach OS has developed a large number of industrial Internet services in different regions and industries. Among them, the CEC Fujian Industrial Cloud Platform is a regional industry cloud platform operated by CEC FreundSchaft Technology Co., Ltd., a three-tier subsidiary of CEC Group, serving the footwear and textile industries.

A series of explorations have been carried out on the industry and finance platform based on the IoT. The platform focuses on three core capabilities of smart hardware, smart risk control, and IoT finance. It supervises the main production factors of manufacturing enterprises through the IoT in real time. Through cooperation with Baidu Smart Cloud, it integrates IoT finance and risk control evaluation capabilities. Connect to the CEC Fujian Industrial Internet platform to build big data for industry and finance, and realize cloud-based intelligent risk control and credit evaluation capabilities. By strengthening the physical perception, precise positioning, real-time monitoring, dynamic measurement, and automatic early warning of production equipment and materials, the intelligent perception of production factor financing, full-process tracking management, standardized supervision and operation are realized, and the reform of financial risk control is accelerated to make offline Online finance, innovating an ecological model of real-time controllable integration of finance and entities.

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Keynote 8: 5G-Lead, Data & Intelligence-Driven, Digital Twins Shape the New Pattern of Smart City

Jinzhou Yang, China Unicom, China

About the Keynote Speaker



Jinzhou Yang graduated from Beijing University of Posts and Telecommunications with a master's degree. He is the chief consultant of China Unicom's digital economy and the director of the Smart City Research Office in China Unicom Research Institute. His main research directions are industrial Internet business, smart city top-level design, blockchain and digital economy planning, with nearly 20 provincial and municipal smart city and digital government-related top-level designs and more than 70 industry solutions experience. Jinzhou Yang is also an ITU standard expert, member of national smart city standardization overall group and "Internet +" alliance. He has successively obtained the certification of cloud computing and big data senior architect and planner issued by the Talent Exchange Center of the Ministry of Industry and Information Technology. Besides, he patented more than 30 inventions and published many papers on smart city, blockchain and big data.

Summary: At present, 5G, big data and artificial intelligence have become the leading and driving force in the construction of smart cities. With the gradual maturity of digital twin technology and the continuous improvement of urban digital infrastructure, especially with the rise of "Metaverse", smart cities are facing new development opportunities. In the future, the deep integration of digital technology will significantly improve the efficiency of urban governance, complement the shortcomings of the city, strengthen the global intelligence, and truly realize the intelligent and sustainable development of the city.

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IEEE HPCC/SmartCity/DSS/DependSys/GPC/DIKW-2021

Physical Presentation Program

Monday December 20, 2021 (China Standard Time CST, UTC+8)

09:00-10:00	Opening Ceremony
10:00-10:20	Coffee Break
10:20-11:00	Keynote 1: IT/OT Fusion and Next Generation Industrial Software Linfu Sun , Southwest Jiaotong University, China Chaired by Bing Guo, Sichuan University, China
11:00-11:40	Keynote 2: Advanced Applications of Brain Science + AI + Grid Edge Supercomputing Steve Chen , 3rd Brain Research Institute, USA Chaired by Rong Gu, Nanjing University, China
11:40-12:20	Keynote 3: Beef Up the Edge: Building a Service Network for Sensing, Communications, Computing, Storage and Intelligence at the Edge Yuguang “Michael” Fang , University of Florida, USA Chaired by Xiaokang Wang, St. Francis Xavier University, Canada
12:20-14:30	Lunch Break
14:30-15:10	Keynote 4: AI Everywhere: From Cloud Computing to Edge Computing Wayne Dai , VeriSilicon, China Chaired by Huazhong Liu, Hainan University, China
15:10-15:50	Keynote 5: Deep Learning-Based Vulnerability Detection for Open-Source Software Deqing Zou , Huazhong University of Science and Technology, China Chaired by Xianjun Deng, Huazhong University of Science and Technology, China
15:50-16:30	Keynote 6: Edge Intelligence – Engineering the New Fabric of IoT, Edge, and Cloud Schahram Dustdar , Vienna Technical University, Austria Chaired by Qingchen Zhang, Hainan University, China
16:30-16:50	Coffee Break
16:50-17:30	Keynote 7: Practice and Exploration of Industry and Finance Platform Based on the IoT Gang Xia , CEC Industrial Internet, China Chaired by Hua Li, Hainan University, China
17:30-18:10	Keynote 8: 5G-Lead, Data & Intelligence-Driven, Digital Twins Shape the New Pattern of Smart City Jinzhou Yang , China Unicom, China Chaired by Bang Wang, Huazhong University of Science and Technology, China
18:10-19:30	Reception

Tuesday December 21, 2021 (China Standard Time CST, UTC+8)

Room	Room 1	Room 2	Room 3	Room 4	Room 5	Room 6	Room 7 (Online)
8:00-9:40	HPCC-1: High Performance Computing and Applications (I)	HPCC-2: High Performance Computing and Applications (II)	HPCC-3: High Performance Computing and Applications (III)	HPCC-4: Parallel and Distributed Computing and Systems (I)	DIKW-1: Artificial Intelligence	DIKW-2: Networks, Algorithms and Graph	
9:40-10:05	Coffee Break						
10:05-11:45	HPCC-5: Parallel and Distributed Computing and Systems (II)	HPCC-6: Communications and Networking (I)	HPCC-7: Communications and Networking (II)	SmartCity-1: Smart City Systems (I)	SmartCity-2: Smart City Systems (II)	SmartCity-3: Enabling Technologies for Smart City (I)	
11:45-13:30	Lunch Break						
13:30-15:10	HPCC-8: Communications and Networking (III)	HPCC-9: Communications and Networking (IV)	HPCC-10: Communications and Networking (V)	GPC-1: Intelligent Sensing and Computing	SmartCity-4: Big Data and Data Mining For City (I)	SmartCity-5: Big Data and Data Mining For City (II)	
15:10-15:30	Coffee Break						
15:30-17:10	HPCC-11: Communications and Networking (VI)	HPCC-12: Communications and Networking (VII)	HPCC-13: Communications and Networking (VIII)	GPC-3: Pervasive and Green Applications (II)	SmartCity-6: Big Data and Data Mining For City (III)	SmartCity-7: Big Data and Data Mining For City (IV)	
17:10-18:10	SmartCity-13: Smart Systems	SmartCity-10: Smart City Services (II)	DSS-2: Data Science and Systems	GPC-2: Pervasive and Green Applications (I)	DependSys-1: Security Fundamentals and Technologies	DependSys-2: Security Fundamentals and Technologies	
18:10-19:30	Banquet						

Wednesday December 22, 2021 (China Standard Time CST, UTC+8)

Room	Room 1	Room 2	Room 3	Room 4	Room 5	Room 6	Room 7 (Online)
8:00-9:40	HPCC-14: High Performance Computing and Applications (IV)	HPCC-15: High Performance Computing and Applications (V)	HPCC-16: Parallel and Distributed Computing and Systems (III)	SmartCity-8: Big Data and Data Mining For City (V)	SmartCity-9: Smart City Services (I)	DIKW-4: Data-Information-Knowledge-Wisdom	
9:40-10:05	Coffee Break						
10:05-11:45	HPCC-17: Communications and Networking (IX)	HPCC-18: Communications and Networking (X)	HPCC-19: Artificial Intelligence Empowered Efficient and Secure 6G Networking and Communications (I)	DIKW-5: Analysis and Natural Phenomena	DIKW-6: Weather Forecast	DIKW-3: Blockchain	
11:45-13:30	Lunch Break						
13:30-15:10	HPCC-20: Artificial Intelligence Empowered Efficient and Secure 6G Networking and Communications (II)	HPCC-21: Distributed Intelligence for Future High Performance Unmanned Mobile Systems (I)	HPCC-22: Distributed Intelligence for Future High Performance Unmanned Mobile Systems (II)	SmartCity-11: Enabling Technologies for Smart City (II)	DIKW-8: Wind Forecast	DIKW-7: Database Performance	
15:10-15:30	Coffee Break						
15:30-17:10	HPCC-23: Smart Systems and Applications Empowered by Computing, Communication and Control Techniques (I)	HPCC-24: Smart Systems and Applications Empowered by Computing, Communication and Control Techniques (II)	HPCC-25: Smart Systems and Applications Empowered by Computing, Communication and Control Techniques (III)	SmartCity-12: Smart City Services (III)	DSS-1: Data Science and Systems	DIKW-9: Data-Information-Knowledge-Wisdom	

The HPCC 2021 Physical Presentation Program

HPCC-1: High Performance Computing and Applications (I)

Session Chair: Jing Yang, Huazhong University of Science and Technology, China

1. *A Transpose-Free Three-Dimensional FFT Algorithm on ARM CPUs*
Tun Chen; Haipeng Jia; Zhihao Li; Chendi Li; Yunquan Zhang

2. *Visual Sensitivity Aware Rate Adaptation for Video Streaming via Deep Reinforcement Learning*
Jin Ye; Meng Dan

3. *Three-Level Compact Caching for Search Engines Based on Solid State Drives*
Rui Zhang; Pengyu Sun; Jiancong Tong; Ruirui Zang; Heng Qian; Yu Pan; Rebecca J. Stones; Gang Wang; Xiaoguang Liu; Yusen Li

4. *A Fine-Grained Volley Gesture Recognition Method With Direction Independence*
Zhanjun Hao; GaoYuan Liu; Xiaochao Dang; Daiyang Zhang; Yanhong Bai; Hongwen Xu

5. *Universal Adversarial Attack Against 3D Object Tracking*
Riran Cheng; Nan Sang; Yinyuan Zhou; Xupeng Wang

HPCC-2: High Performance Computing and Applications (II)

Session Chair: Ning Zhang, Huazhong University of Science and Technology, China

1. *Efficient Hardware Redo Logging for Secure Persistent Memory*
Zhan Zhang; Jianhui Yue; Xiaofei Liao; Hai Jin

2. *A Cost-Efficient Metadata Scheme for High-Performance Deduplication Systems*
Yuxuan Mo; Yu Hua; Pengfei Li; Qin Cao; Xue Liu

3. *High Speed True Random Number Generator Controlled by Logistic Map*
Yuling Luo; Shuming Han; Shunsheng Zhang; Yanhu Wang; Junxiu Liu

4. *DRStencil: Exploiting Data Reuse Within Low-Order Stencil on GPU*
Xin You; Hailong Yang; Zhonghui Jiang; Zhongzhi Luan; Depei Qian

5. *Attention-Based F-UNet for Remote Sensing Image Fusion*
Pingfan Zhang; Qian Jiang; Li Cai; Ruxin Wang; Puming Wang; Xin Jin

HPCC-3: High Performance Computing and Applications (III)

Session Chair: Yaliang Zhao, Henan university, China

1. *AP³: Adaptive Power Prediction Framework Based on Spatial Partition Multi-Phase Model*
Juan Chen; Zhixin Ou; Yifei Guo; Xinxin Qi; Yuyang Sun; Lin Deng; Hongyu Chen; Zihan Lin

2. *Personalized QoE Optimization With Edge-Aided Video Enhancement Services*
Hanlong Liao; Guoming Tang; Teng Liang; Longguang Wang; Deke Guo

3. *Frend for Edge Servers: Reduce Server Number! Keeping Service Quality!*
Pengmiao Li; Yuchao Zhang; Wendong Wang; Kaichuan Zhao; Bo Lian; Ke Xu; Zhili Zhang

4. *Advanced Architecture Design of High-Radix Router Based on Chiplet Integration and IP Reusability*
Chongshan Liang; Dai Yi; Weixia Xu; Qiong Li

5. *Embrace the Conflicts: Exploring the Integration of Single Port Memory in Systolic Array-Based Accelerators*
Renyu Yang; Junzhong Shen; Mei Wen; Yasong Cao; Yuhang Li

HPCC-4: Parallel and Distributed Computing and Systems (I)

Session Chair: Yixuan Geng, Huazhong University of Science and Technology, China

1. *HotFed: Hot Start Through Self-Supervised Learning in Federated Learning*

Juan Zhao; Ruixuan Li; Haozhao Wang; Zijun Xu

2. *Semi-Supervised Federated Learning With Non-IID Data: Algorithm and System Design*

Zhe Zhang; Shiyao Ma; Jiangtian Nie; Yi Wu; Qiang Yan; Xiaoke Xu; Dusit Niyato

3. *On-Demand Intelligent Routing Algorithms for the Deterministic Networks*

Zhongli Wu; Wenrui Huang; Zhewei Dai; YuanYuan Cao; Bin Dai; Yijun Mo

4. *Distributed Service Placement in Ultra-Dense Edge Computing: A Game-Theoretical Approach*

Junyi He; Di Zhang; Xishuo Li; Yuezhi Zhou; Yaoxue Zhang

5. *ER-KV: High Performance Hybrid Fault-Tolerant Key-Value Store*

Yingjie Geng; Jinfei Luo; Gang Wang; Xiaoguang Liu

HPCC-5: Parallel and Distributed Computing and Systems (II)

Session Chair: Xuemei Fu, Hainan University, China

1. *Bilinear Graph Neural Network-Enhanced Web Services Classification*

Lulu Zhang; Buqing Cao; Mi Peng; Yueying Qing; Guosheng Kang; Jianxun Liu; Kenneth K. Fletcher

2. *An Energy-Efficient Task Scheduling Strategy Based on Improved Fireworks Algorithm in Heterogeneous Cloud*

Hui Zhao; Fanxin Meng; Nanzhi Feng; Quan Wang; Bo Wan; Jing Wang

3. *AMSC: Adaptive Multi-Channel Graph Convolutional Network-Enhanced Web Services Classification*

Yueying Qing; Buqing Cao; Mi Peng; Lulu Zhang; Guosheng Kang; Jianxun Liu; Kenneth K. Fletcher

4. *PSeer: Performance Prediction for Partially Co-Located Distributed Deep Learning*

Weijia Ding; Ziwei Ding; Laiping Zhao; Tie Qiu

5. *The Parallelized Cuckoo Filter for Cold Data Representation*

Bowen Sun; Lailong Luo; Shangsen Li; Yingwen Chen; Deke Guo

HPCC-6: Communications and Networking (I)

Session Chair: Yuan Tian, Huazhong University of Science and Technology, China

1. *Adaptive GRU With Regularization Item for Book Sales Prediction*

Hongyue Xie; Lingwu Liu

2. *DDoS Defense Scheme Based on Machine Learning in Software-Defined Networking*

Hong Zhong; Chao Yu; Jie Cui; Xiuwen Sun; Chengjie Gu; Lu Liu

3. *HER2-MCNN: A HER2 Classification Method Based on Multi Convolution Neural Network*

Xingang Wang; Cuiling Shao; Jiandong Lv; Hu Liang; Na Li

4. *PEAN: A Packet-Level End-To-End Attentive Network for Encrypted Traffic Identification*

Peng Lin; Yishen Hu; Yanying Lin; Kejiang Ye; Chengzhong Xu

5. *Global Cyclic Queuing and Forwarding Mechanism for Large-Scale Deterministic Networks*

Yijun Mo; Zihan Yang; Huiyu Huiyu Liu; Tianliu He

HPCC-7: Communications and Networking (II)

Session Chair: Yaliang Zhao, Henan university, China

1. *DyDom: Detecting Malicious Domains With Spatial-Temporal Analysis on Dynamic Graphs*

Yixin Li; Xi Luo; Liming Wang; Zhen Xu

2. *GMAF: A Novel Gradient-Based Model With Arcface for Network Traffic Classification*

Yaohua Xia; Gang Xiong; Zhen Li; Gaopeng Gou; Chang Liu

3. *A Sequential Recommendation of Hawkes Process Fused With Attention Mechanism*
Xilin Wen; Jianfang Wang; Xu Yang; Qiuling Zhang

4. *TunnelScanner: A Novel Approach for Tunnel Mixed Traffic Classification Using Machine Learning*
Panpan Zhao; Zhen Li; Mingxin Cui; Jie Lu; Gang Xiong; Gaopeng Gou

5. *Large-Scale Measurement of Encrypted TLS Server Name Indication (ESNI): How Far Have We Come?*
Yangyang Guan; Wei Xia; Gaopeng Gou; Peipei Fu; Bingxu Wang; Zhen Li

HPCC-8: Communications and Networking (III)

Session Chair: Yixuan Geng, Huazhong University of Science and Technology, China

1. *RF Transmitter Identification and Classification Based on Deep Residual Shrinkage Network*
Xiuhua Wen; Chunjie Cao; Yang Sun; Yifan Li; Haifeng Peng

2. *A Novel Reinforcement Learning Framework for Adaptive Routing in Network-On-Chips*
Changhong Wang; Dezun Dong; Zicong Wang; Xiaoyun Zhang; Zhenyu Zhao

3. *Interference-Aware Trajectory Design for Fair Data Collection in UAV-Assisted IoT Networks by Deep Reinforcement Learning*
Gong Chen; Xiangping Bryce Zhai; Congduan Li

4. *Efficiently Managing Large-Scale Keys in HDFS*
Wei Jin; Kui Geng; Mingjie Yu; Yunchuan Guo; Fenghua Li

5. *Optimal Deployment Design of Repeaters and Memories in Quantum Networks*
Jiangyuan Yao; Kaiwen Zou; Deshun Li; Zheng Jiang

HPCC-9: Communications and Networking (IV)

Session Chair: Minghua Wang, University of South China, China

1. *RSM-PA: Research on Route Selection Method of Inter-Domain Routing System Based on Path Availability*
Huihu Zhu; Han Qiu; Junhu Zhu; Qingxian Wang

2. *BEDIM: Lateral Movement Detection in Enterprise Network Through Behavior Deviation Measurement*
Cong Dong; Yufan Chen; Yunjian Zhang; Yunjian Zhang; Zhigang Lu; Pu Dong; Baoxu Liu

3. *Jumping on the Bandwagon: Group Opinion Prompts Agents to Reach Consensus*
Si Cheng; Can Sun; Song Yang; Minghua Xu; Han Xu

4. *Punchcard: A Practical Red-Zone Based Scheme for Low-Overhead Heap Protection*
Chaochao Zhang; Amro Awad; Rui Hou; Rui Hou

5. *A Contextual and Content Features-Based Device Behavioral Fingerprinting Method in Smart Grid*
Zhongfeng Jin; Nan Li; Chao Liu; Meimei Li; Shaohua An; Weiqing Huang

HPCC-10: Communications and Networking (V)

Session Chair: Jing Yang, Huazhong University of Science and Technology, China

1. *Accelerating Robot Reinforcement Learning With Samples of Different Simulation Precision*
Yong Zhao; Yuanzhao Zhai; Jie Luo; Dawei Feng; Bo Ding; Zhen Li

2. *Network Latency Estimation: A Tensor-Based Weighted Singular Value Thresholding Method*
Weice Sun; Jun Tao; Yifan Xu; Yang Gao; Zuyan Wang

3. *HSS: Faster and More Accurate Sliding Sketch by Using Half Fields*
Zijun Hang; Yongjie Wang; Yongjie Wang; Shuguang Huang

4. *HASP: High Availability SFC Placement Approach in Data Center Network*
Ziqi Xu; Qingmian Han; Bo Cheng; Meng Niu; Junliang Chen

5. *Distributed Pseudonym Mechanism Based on Consortium Blockchain*
BaoHui Li; MiaoMiao Wang; Shiyou Chen; Lanlan Rui; Yang Yang; Zhipeng Gao

HPCC-11: Communications and Networking (VI)

Session Chair: Yixuan Geng, Huazhong University of Science and Technology, China

1. *A Dynamic Algorithm for Submodular Maximization With a Knapsack Constraint*
Tianshuai Zhu; Kai Han; Enpei Zhang; BenWei Wu

2. *BOBBLE: A Mixed Routing-Granularity Distributed Load Balancing for Data Center Networks*
Zhengzhi Xu; Yifei Lu; Xu Ma

3. *MEMG: Mobile Encrypted Traffic Classification With Markov Chains and Graph Neural Network*
Wei Cai; Gaopeng Gou; Minghao Jiang; Chang Liu; Gang Xiong; Zhen Li

4. *Feature Engineering Framework Based on Secure Multi-Party Computation in Federated Learning*
Litong Sun; Runmeng Du; Daojing He; Shanshan Zhu; Rui Wang; Sammy Chan

5. *Learning-Based Task Offloading in Dynamic Orbital Edge Computing Network*
Jiang Fang; Haitao Liu; Jiyan Sun; Ting Li; Yinlong Liu; Zhaorui Guo; Shangyuan Zhuang; Liru Geng

HPCC-12: Communications and Networking (VII)

Session Chair: Debin Liu, Huazhong University of Science and Technology, China

1. *Detecting Data Leakage in DNS Traffic Based on Time Series Anomaly Detection*
Futai Zou; Yundong Ren ; Jiachen Zhu; Junhua Tang

2. *An SEI-Based Identification Scheme for Illegal FM Broadcast*
Shaoying Guo; Yanyun Xu; Weiqing Huang; Bo Liu

3. *Browser Fingerprinting Identification Using Incremental Clustering Algorithm Based on Autoencoder*
Futai Zou; Haochen Zhai

4. *A Two-Stage Deanonimization Attack Towards Bitcoin Hidden Service Nodes*
Yue Gao; Jinqiao Shi; Xuebin Wang; Ruisheng Shi; Can Zhao; Chenglong Li

HPCC-13: Communications and Networking (VIII)

Session Chair: Jing Yang, Huazhong University of Science and Technology, China

1. *Secure Skyline Groups Queries on Encrypted Data on Cloud Platform*
Yiping Teng; Yue Sun; Zhan Shi; Dongyue Jiang; Liang Zhao; Chunlong Fan

2. *A Privacy-Aware Cross-Domain Device Authentication Scheme for IIoT Based on Blockchain*
Boyuan Gao; Hairong Yan; Rui Tian

3. *Semantic-Based Heterogeneous Controller Collaboration for Space-Terrestrial Integrated Networks*
Yaru Bao; Feilong Tang; Xu Li; Long Chen; Jiacheng Liu; Yanqin Yang; Wenchao Xu; Lijun Cao; Ping Han

4. *TeeSwap: Private Data Exchange Using Smart Contract and Trusted Execution Environment*
Peng Chen; Peichang Shi; Jie Xu; Xiang Fu; Linhui Li; Tao Zhong; Liangliang Xiang; Liangliang Xiang

5. *A Novel Path Planning-Aware Vehicular Task Offloading Strategy*
Yufei Liu; Liang Zhao; Kaiqi Yang; Yunpeng Li

HPCC-14: High Performance Computing and Applications (IV) (Short Paper)

Session Chair: Minghua Wang, University of South China, China

1. *CMLB: A Communication-Aware and Memory Load Balance Mapping Optimization for Modern NUMA Systems*
Jingbo Li; Yuxin Zhang; Xingjun Zhang

2. *Optimized Monocular Depth Estimation with Reparameterization on Embedded Devices*
Siping Liu; Renfa Li; Xiaohan Tu; Guoqi Xie; Cheng Xu

3. *A Noc Centric Low Overhead Multi-Chip Interconnection Technology*
Xing Hu; Yang Zhang; Li Mao; Jie Shen; Zuo Cheng Xing

4. *Efficient Memory Access-Aware BWA-SMEM Seeding Accelerator for Genome Sequencing*
Zhang Ying; Li Luo; Jian Zhang; Quanyou Feng; Lei Wang

5. *Zone Based Writing Optimization in User Space*
Runnan Shen; Yuting Liu; Rui Zhang; Jinbin Zhu; Zhonglin Liu; Limin Xiao

6. *Winograd-CNN Accelerator Compatible With Sparse and Non-Sparse Models*
Huazheng Li; Weiting Chen; Jiangtao Wang

HPCC-15: High Performance Computing and Applications (V) (Short Paper)
Session Chair: Xin Nie, Huazhong University of Science and Technology, China

1. *A High-Precision DQDS Algorithm*
Chuanying Li; Xiong Xiao; Peibing Du; Hao Jiang; Roberto Barrio; Zhe Quan; Kenli Li

2. *Task Offloading and Parameter Optimization of MAR in Multi-Access Edge Computing*
Yumei Li; Xiumin Zhu; Shudian Song; Shuyue Ma; Feng Yang; Linbo Zhai

3. *A Word-Length Optimized Parallel Framework for Accelerating Option Pricing Model*
Yuan Li; Lei Zhang; Yi Dai; Yi Dai

4. *Reinforcement Learning Based Data Compression for Energy-Efficient Non-Volatile Caches*
Fanfan Shen; Chao Xu; Jun Zhang; Yong Chen; Yanxiang He

5. *Characterizing OpenMP Synchronization Implementations on ARMv8 Multi-Cores*
Pengyu Wang; Wanrong Gao; Jianbin Fang; Chun Huang; Zheng Wang

HPCC-16: Parallel and Distributed Computing and Systems (III) (Short Paper)
Session Chair: Yaliang Zhao, Henan university, China

1. *Containerized Workflow Builder for Kubernetes*
Chenggang Shan; Guan Wang; Yuanqing Xia; Yufeng Zhan; Jinhui Zhang

2. *FNCS: Federated Learning Strategy Based on Cosine Similarity Under Resource Constraints*
Ruonan Li; Yang Qin; Lu Zang

3. *Research on Cross-Camera Person Re-Identification Using Overlapping Field of View*
Zhibin Zhao; Yinuo Yao; Huicheng Chen; Jun Wang; Yongming Yan

4. *A Multiobjective Memetic Algorithm for Workflow Scheduling on Heterogeneous Computing Systems*
Chengming Zou; Peng Cheng; Mengyuan Shi; Xing Liu

5. *A Branch-And-Bound Algorithm for Computing the Reliable Isolated Zeros of Multivariate Polynomial Functions Systems*
Cheng Chen; Liangyu Chen; Zhenbing Zeng; Dang Lin

6. *A Mapping-Based Dynamic Semi-Online Task Scheduling Method for Minimizing Energy in Edge Computing*
Hui Zhao; Nanzhi Feng; Fanxin Meng; Quan Wang; Bo Wan; Jing Wang

HPCC-17: Communications and Networking (IX) (Short Paper)
Session Chair: Debin Liu, Huazhong University of Science and Technology, China

1. *A Message-Based Malicious Detection Scheme of Public DNS Services*
Chaoqun Li; Liang Dai; Zhen Xu; Ying Ding; Yanni Han

2. *StatekeepSpec: Securing Speculative Execution via Forbidding Change-Of-State*
Zhiyuan Lv; Youjian Zhao

3. *A Dual Adaptive Factorization Network for CTR Prediction*
Xianzhuang Li; Zhen Wang; Xuesong Wu; Bo Yuan; Xueqian Wang

4. *An End-To-End IP Header Compressed Packet Forwarding Framework for Bandwidth Constrained Networks*
Wen-Kang Jia; LiTian Chen; Jianhui Xiong; Zhixin Xu

5. *Research on Competition and Cooperation in the Process of Multi-Source Information Dissemination in Social Network*
Jing Chen; Jincheng Huang; Yaxuan Sun

HPCC-18: Communications and Networking (X) (Short Paper)

Session Chair: Jiuzhen Zeng, Huazhong University of Science and Technology, China

1. *T-Path Based Reliable and Real-Time Routing in Battery-Free Wireless Sensor Network*
Kunyi Chen; Hong Gao; Siyao Cheng; Quan Chen; Jianzhong Li

2. *A Novel Joint Prediction Model of Atmospheric Attenuation for Co-Frequency Interference Analysis between LEO Constellations*
Degang Sun; Jingru Geng; Wen Wang; Yiqing Liu

3. *A Coverage-Guided Fuzzing Framework for Trusted Execution Environments*
Chenlin Huang; Yusong Tan; Guoyun Duan; Zhiwen Chen; Boyang Zhang; Peiyao Deng; Qianxiang Zhang; Jianhua Sun; Hao Chen; Guoqing Xiao; Qing Liao

4. *A Novel Feature Method for Fast Extraction of Mining Traffic*
Peifa Sun; Lizhi Peng; Bo Yang; Shuaili Liu

5. *A Highly Efficient Profiled Power Analysis Attack Based on Power Leakage Fitting*
Yuanzhi Li; Shanshan Xu; Yuling Luo; Sheng Qin; Shunsheng Zhang; Min Su

6. *A Residual Fingerprint-Based Defense Against Adversarial Deepfakes*
Jianguo Jiang; Boquan Li; Shuai Yu; Chao Liu; Shaohua An; Mingqi Liu; Min Yu

HPCC-19: Artificial Intelligence Empowered Efficient and Secure 6G Networking and Communications (I) (Special Session 1)

Session Chair: Yaliang Zhao, Henan university, China

1. *Distributed Trust Evaluation Mechanism of LEO Satellites for 6G Network*
Hui Li; DongChong Shi; Ruijin Zhou; Dan Liao; Ming Zhang; Yuliang Zhou

2. *The Ultra-Wideband Communication Systems: A Human Gesture Recognition Approach*
Anna Li; Eliane Bodanese; Fei Luo; Tianwei Hou; Kaishun Wu

3. *Fast Synchronization of Model Updates for Collaborative Learning in Micro-Clouds*
Long Luo; Yuchen Zhang; Qixuan Jin; Hongfang Yu; Gang Sun; Shouxi Luo

4. *Resource-Efficient DNN Training and Inference for Heterogeneous Edge Intelligence in 6G*
Enfang Cui; Weiting Zhang; Dong Yang; Wen Wu; Feng Lyu

5. *FIT: Fairness-Aware Intelligent Traffic Signal Control With Deep Reinforcement Learning*
Jian Chen; Zhengwei Zhang; Jianhang Feng; Kun Zhu

6. *Attributes Based Bayesian Unknown Hazards Assessment for Digital Twin Empowered Autonomous Driving*
Zhonglin Hou; Hong Liu; Yan Zhang

HPCC-20: Artificial Intelligence Empowered Efficient and Secure 6G Networking and Communications

(II) (Special Session 1)**Session Chair: Ruonan Zhao, Huazhong University of Science and Technology, China**

- 1. Edge Intelligence-Based UAV Human Target Recognition With Improved YOLOV5 Algorithm*
Zeyu Cai; Yuben Qu; Chao Dong
- 2. Knowledge-Assisted DRL for Energy Harvesting Based Multi-Access Wireless Communications*
Sheng Luo; Haodi Zhang; Qifan Li; Kaishun Wu
- 3. Federated Learning With Dynamic Staleness Correction for Privacy Protection in Vehicular Networks*
Jiajia Liu; Hao Wu
- 4. Collaborative Mobile Charging Vehicles Placement: A Reinforcement Learning Approach*
JiaNing Ni; RuPeng Liang; Hao Wu
- 5. Collaborative Quantum Inspired Ant Colony Algorithm for Airport Taxiway Routing*
Ling Qian; Dan Li; Xu Chen; Panpan Ding
- 6. A Hybrid Model Combined With SVM and CNN for Community Content Classification*
Yukui Ye; Xia Xie; Hai Jin; Duoqiang Wang

HPCC-21: Distributed Intelligence for Future High Performance Unmanned Mobile Systems (I) (Special Session 2)**Session Chair: Jiuzhen Zeng, Huazhong University of Science and Technology, China**

- 1. An Improved RRT*-Based Real-Time Path Planning Algorithm for UAV*
Di Xu; Qian Hongyan; Zhang Shuheng
- 2. ASTC: An Adaptive Gradient Compression Scheme for Communication-Efficient Edge Computing*
Jun Wu; Yingchi Mao; Xuesong Xu
- 3. PAL-FD: An Efficient and Accurate Multi-Scene Human Face Detection Tool for Windows*
Shuai Xu; Zhelong Huang; Pinyi Qian; Jiacheng Cen; Donghai Guan
- 4. A Spatiotemporal Analysis of Age of Information at V2X-Enabled Intersection*
Yaying Wang; Guoping Tan; Siyuan Zhou; Dengsong Yang; Baili Ni
- 5. A Lightweight VK-Net Based on Motion Profiles for Hazardous Driving Scenario Identification*
Zhen Gao; Jingning Xu; Jiang Yu Zheng; Hongfei Fan; Rongjie Yu; JiaQi Zong; Xinyi Li
- 6. Pose Adaptive Margin Loss for Face Verification*
Jie Lei; BaiYan Zhang; Linglin Xia; Hefei Ling

HPCC-22: Distributed Intelligence for Future High Performance Unmanned Mobile Systems (II) (Special Session 2)**Session Chair: Junjie Su, Huazhong University of Science and Technology, China**

- 1. Reinforcement Learning-Based Black-Box Evasion Attacks to Link Prediction in Dynamic Graphs*
Houxiang Fan; Binghui Wang; Pan Zhou; Ang Li; Zichuan Xu; Cai Fu; Hai Li; Yiran Chen
- 2. Blockchain-Based Decentralized Federated Learning: A Secure and Privacy-Preserving System*
Shuang Zhao; Yalun Wu; Rui Sun; Xiaoi Qian; Dong Zi; Zhiqiang Xie; Endong Tong; Wenjia Niu; Jiqiang Liu; Zhen Han
- 3. Joint User Scheduling and Trajectory Planning for QoS in UAV-Based NOMA Networks*
Jia Li; Xiangping Bryce Zhai; Xin Liu
- 4. On Performance of Cooperative V2X Communication With Vehicular Platoon Systems*
Siyuan Zhou; Qianqian Wu; Guoping Tan; Dengsong Yang; Baili Ni
- 5. Adaptive Network Formation and Trajectory Optimization for Multi-UAV-Assisted Wireless Data Offloading*

Meng Wang; Yusi Long; Shimin Gong; Jing Xu

6. *Distributed Consensus Problem in Federated Learning Paradigm*

Xin Yan; Yiming Qin; Xiaodong Hu

HPCC-23: Smart Systems and Applications Empowered by Computing, Communication and Control Techniques (I) (Special Session 3)

Session Chair: Ruonan Zhao, Huazhong University of Science and Technology, China

1. *A Refined Lane Recognition Method Based on LiDAR and Its Verification*

Dong He; Kai Gao; Jin Xie; Ronghua Du; Haojie Li; Xunhao Li; Shuo Huang

2. *Flocking of Battery-Powered Mobile Agents With Energy-Aware Potential Function*

Fu Jiang; Yaixin Xia; Heng Li; Zhongke Zhang; Xiaoyong Zhang; Jun Peng

3. *An Energy Dispatch Mechanism Based on Double Auction With Multiple Rounds for a Microgrid*

Weirong Liu; Cheng Ma; Yijun Cheng; Fu Jiang; Jieqi Rong; Jun Peng

4. *A Real-Time Demand Response Strategy of Home Energy Management by Using Distributed Deep Reinforcement Learning*

Weirong Liu; Yujie Wang; Fu Jiang; Yijun Cheng; Jieqi Rong; Chenglong Wang; Jun Peng

5. *DMF-MPC: A Dual-Stage and Multi-Step Forecasting Model Based Cooling System Control Method for Data Center Energy Cost Minimization*

Xinrui He; Weiduo Chen; Xiaoshe Dong; Qiang Wang; Jialin Liu; Fan Dong; Yuanqi Su

HPCC-24: Smart Systems and Applications Empowered by Computing, Communication and Control Techniques (II) (Special Session 3)

Session Chair: Jiuzhen Zeng, Huazhong University of Science and Technology, China

1. *A Video Stitching System of Underwater Image*

Zhenyu Wang; Haoming Wu; Tianming Yu; Mengqin Fu; Bernie Liu; Jieren Cheng; Quanfeng Ye; Ni Zhang; Shuo Huang; Xingyue Lu; Kai Lu

2. *Supercapacitor Digital Twin Management System Based on Cloud Environment*

Yingze Yang; QinXian Zhao; Dianzhu Gao; Jieqi Rong; YunSheng Fan; Heng Li; Jun Peng

3. *A Novel Fatigue Driving Detection Method under the Mask-Wearing Condition*

Shengyi Lv; Hui Wang; Sirui Ni; Jiangpeng Li; Zeli Zhao; Yuhan Zhang; Yuqian Cheng; Yunchuang Zhang; Bernie Liu; Xiulai Li

4. *Falsified CV Data Attack Detection Based on LSTM*

Kai Gao; Shuo Huang; Ronghua Du; Jin Xie; Xiangyu Cheng; Dong He

5. *The Digital Twin Model of Chemical Production Systems in Smart Factories: A Case Study*

Heng Li; Zheng Liu; Wei Yuan; Guiheng Chen; XiaoLong Chen; Yingze Yang; Jun Peng

6. *An Accurate and Interpretable Lifetime Prediction Method for Batteries Using Extreme Gradient Boosting Tree and TreeExplainer*

Fu Jiang; Youzhi He; Dianzhu Gao; Yun Zhou; Weirong Liu; Lisen Yan; Jun Peng

HPCC-25: Smart Systems and Applications Empowered by Computing, Communication and Control Techniques (III) (Special Session 3)

Session Chair: Junjie Su, Huazhong University of Science and Technology, China

1. *SAI: Self-Adjusting Incremental Quantile Estimation for Sparse Training of Neural Networks on Hardware Accelerators*

Jianchao Yang; Mei Wen; Minjin Tang; Junzhong Shen; Chunyuan Zhang

2. *EEG and Forehead EOG-Based Driver Fatigue Classification Using Sparse-Deep Belief Networks*
Jie Zhang; Nanfeng Xiao

3. *Triple Extraction of Knowledge Graphs With DGWPN*
Yipei Song; Rongheng Lin; Hua Zou

4. *BOFSanitizer: Efficient Locator and Detector for Buffer Overflow Vulnerability*
Wenzhi Wang; Meng Fan; Aimin Yu; Dan Meng

5. *A Digital Twin Model for the Battery Management Systems of Electric Vehicles*
Heng Li; Muaaz Bin Kaleem; I-Ju Chiu; Dianshu Gao; Jun Peng

6. *Enhancing the Performance of Liquid State Machine With Time-Division Sampling and Reservoir Reconstructing*
Yuchen Qiu; Lei Wang; Xiaofan Chen; Lianhua Qu

The SmartCity 2021 Physical Presentation Program

SmartCity-1: Smart City Systems (I)

Session Chair: Debin Liu, Huazhong University of Science and Technology, China

- 1. Optimization Model for Collaborative Overhaul Workshop Scheduling Problem of Multiple EMUs*
Weijiao Zhang; Zhongkai Wang; Zhikai Jia; Hui Wang
- 2. Small Traffic Sign Detector in Real-Time Based on Improved YOLO-v4*
Tingting Yang; Chao Tong
- 3. Optimized Model and Algorithm for Scheduling Turnaround Routes of Electric Multiple Units*
Zhongkai Wang; Tianyun Shi; Weijiao Zhang; Hui Wang
- 4. High-Speed Train Intelligent Maintenance Pattern and Edge-Computing Perception Model*
Peng Sun; Weijiao Zhang; Zhikai Jia
- 5. HIVE: Route Optimization Problem of Automatic Delivery System With Mobile Depot and Multiple Drones*
Yao Liu; Xuening Chang; Yuzhen Zhou; Shuo Dang; Jianmai Shi; Zhong Liu
- 6. Adaptive Channel Detection for Full-Duplex Based IAB Systems on Unlicensed Channels*
Qiqi Xiao; Zheyi Wu; Jiantao Yuan; Meng Zhou; Guanding Yu; Rui Yin

SmartCity-2: Smart City Systems (II)

Session Chair: Junjie Su, Huazhong University of Science and Technology, China

- 1. A Study of Evidence Cognition in the Simpson Case Towards Smart Justice*
Xuan Zhou; Xiqiong Wan; Yifei Pei; Xiaohua Hu; Weihui Dai
- 2. Improved Algorithm of Thermal Image Target Detection Based on Yolo v4*
Min Dong; Jia Dang; Gangcan Sun; Qi Xue
- 3. Robo-Sweeper: Bionics Based Unmanned Sweeper Platform*
Guanyu Chen; Pan Lv; Hong Li; Guoqing Yang
- 4. Simplification and Compression Method Based on Classified Sparse Sampling for LiDAR Point Cloud*
Jian Chen; YuFang Lin; YuanXiang Chen; Mingkui Zheng; YuYao Zhu
- 5. A Discrete Teaching-Learning-Based Optimization Algorithm for the Green Vehicle Routing Problem*
Xixia Sun; Xianglong Dai; Su Pan; Nan Bao; Ning Liu; Xiaoye Shi

SmartCity-3: Enabling Technologies for Smart City (I)

Session Chair: Wei Xiang, Huazhong University of Science and Technology, China

- 1. An Effective Metaheuristic for Partial Offloading and Resource Allocation in Multi-Device Mobile Edge Computing*
Weirong He; Suxiang Wu; Jin Sun
- 2. Convolutional Capsule Network Based In-Loop Filter for HEVC*
Mengqing Cao; Yue Yu; Jian Chen; Xiuzhi Yang; Zhifeng Chen
- 3. The Design and Implementation of Dust Monitoring System for Photovoltaic Power Generation*
Yuliang Chen; Jiali Ma; Yanhong Ma; Yingli Zhang; Xiaokang Zhou; Rui Zhou
- 4. Lifetime-Driven Scheduling of Security-Critical Internet-Of-Things Applications on Real-Time Heterogeneous Multicore Systems*
Yufan Shen; Kun Cao; Yangguang Cui; Chengliang Zhou; Gongxuan Zhang; Junlong Zhou

5. *Microgrid Forecasting Using Multiple Deep Learning Models*

Daxelle Sakubu; Qi Liu

6. *Model-Fusion-Based Sustainable Trust Assessment Method*

Liang Zhang; Yuan Fang; Jianqiao Sheng; Jingxuan Xu; Xin Ding

SmartCity-4: Big Data and Data Mining For City (I)

Session Chair: Yuan Gao, Huazhong University of Science and Technology, China

1. *A CAN Bus Anomaly Detection Based on FLXGBoost Algorithm*

Jie Wang; Xiuliang Mo

2. *A Method for Calculating the Potential Crowdedness of Urban Emergency Shelters*

Xinxiang Wang; Minglei Guan; Junjie Hu; Chenyang Tian; Hong Shi; Qingquan Li

3. *Distributed Data-Driven Engine Framework Facing CPS Brain-Inspired Intelligent Transportation*

Zhengzhuang Yang; Mingyue Xu; Kaidi Zhao; Chao Yang; Huiyu Zhi; Xihou Zhang; Zhuoran Chen; Song Qiu; Dingding Han

4. *Game Theoretical Bandwidth Allocation in UAV-UGV Collaborative Disaster Relief Networks*

Bincheng Ying; Zhou Su; Qichao Xu; Xiandong Ma

5. *Latency Minimization in Blockchain-Enabled Fog Computing Networks: A Novel Byzantine Fault Tolerance Approach*

Assadig Abdelrhman Sajo; Xiaoge Huang; Moatssim Saif; Qianbin Chen

6. *Cooperative Task Offloading for Internet of Vehicles in Cloud-Edge Computing*

Linjie Gu; Xiaolong Xu; Lianyong Qi; Yiwen Zhang; Xuyun Zhang; Wanchun Dou

SmartCity-5: Big Data and Data Mining For City (II)

Session Chair: Ning Zhang, Huazhong University of Science and Technology, China

1. *Short-Term Speed Prediction of Urban Roads Based on Multi-Source Feature Fusion*

Silin Liu; Zhuhua Liao; Yizhi Liu; Aiping Yi

2. *A Spatial-Temporal Similar Graph Attention Network for Cyber Physical System Perception via Traffic Forecasting*

Kaidi Zhao; Mingyue Xu; Zhengzhuang Yang; Dingding Han

3. *A Lightweight Enterprise Messaging Service at the Edge*

Tingjuan Lu; Jingjing Chen; Ying Zhang; Jia Luo; Tao Wang; Hangyi Chen

4. *ZombieCoin3.0: On the Looming of a Novel Botnet Fortified by Distributed Ledger Technology and Internet of Things*

Haoyu Gao; Leixiao Li; Hao Lin; Xiangyang Chang; Jianxiong Wan; Jie Li; Fangyuan Zhu

5. *The Latest Progress of Research on the Urban Functional Areas Based on CiteSpace Methods*

Yanru Hu; Changfeng Jing

6. *A Comparative Study of Time Series Data Forecasting Using Machine Learning Based on Improved Grey Model*

Yan Li; JiaMing Zhang; Yanhong Ma; Xiaomin Li; Ziang Liu; Xiaokang Zhou; Rui Zhou

SmartCity-6: Big Data and Data Mining For City (III)

Session Chair: Yuan Gao, Huazhong University of Science and Technology, China

1. *Few-Shot Malicious Traffic Classification Based on Siamese Neural Network*

Kailin Wu; Pan Wang; ZiXuan Wang

2. *A Deep Image Denoising Method at Transmit Electricity Surveillance Environment*

Nan Yao; Ziquan Liu; Zhen Wang; Yongling Lu; Jianhua Qin

3. *Trust Evaluation Based on Variable Weight Synthesis*
Mu Chen; Lu Chen; Zaojian Dai; Zhipeng Shao; Yuanyuan Ma

4. *Target Detection of Engineering Vehicles Based on Co-Learning Labels*
Zhen Wang; Nan Yao; Ziquan Liu; Xueqiong Zhu; Hai Xue

5. *A Mobile Internet Multi-Level Two-Way Identity Authentication Scheme Based on Zero Trust*
Lu Chen; Yuwei Sun; Zhixin Sun

6. *An Explainable Intrusion Detection System*
Yun Wang; Pan Wang; ZiXuan Wang; Mengting Cao

SmartCity-7: Big Data and Data Mining For City (IV)

Session Chair: Xin Nie, Huazhong University of Science and Technology, China

1. *Semantic Segmentation of Remote Sensing Image Based on Two-Time Augmentation and Atrous Convolution*
Ruiqi Yang; Yue Zhang; Haiyan Cheng; Yili Zhao; Qinling Dai; Nan Chen

2. *DeepLoc: A Deep Neural Network-Based Indoor Positioning Framework*
Saining Liu; Qianqian Ren; Jinbao Li; Hui Xu

3. *Fast Distributed Stochastic Gradient Descent for Big Data Classification*
Mingfei Xiao; Huihui Wang

4. *GNAS: Generalized Neural Attentive Similarity Model for Recommendation*
Zhilin Cheng; Yanxia Lyu; Jiemin Liu; Cong Wang

5. *Experience-Based Pickup Area Recommendation on Taxi's GPS Trajectories*
Zhuhua Liao; Jian Zhang; Aiping Yi; Yizhi Liu; Yijiang Zhao; Silin Liu

6. *Design and Implementation of Monitoring System for New Energy Data Call Based on Blockchain*
Ziang Liu; Yuanyuan Huang; Qiang Zhou; Yingli Zhang; Xiaokang Zhou; Rui Zhou

SmartCity-8: Big Data and Data Mining For City (V)

Session Chair: Ziheng Xiao, Huazhong University of Science and Technology, China

1. *Blind Image Quality Assessment Based on Multi-Scale Spatial Pyramid Pooling*
Fangfang Lu; Feng Qin; Jingjing Chen

2. *A Comprehensive Study of Present Data Deduplication*
Zilong Xue; Huixun Qian; Lingling Shen; Xiaotong Wu

3. *EEAI: An End-Edge Architecture for Accelerating Deep Neural Network Inference*
Guozhi Liu; Fei Dai; Bi Huang; Zhenping Qiang; Lecheng Li; Shuai Wang

4. *SA_3AM: A Novel Sentiment Analysis Approach Integrating Three-Level Attention Mechanism*
Qingren Wang; Liang Sun; Jie Cui; Jing Zhang

5. *Photovoltaic Power Forecasting in Dunhuang Based on Recurrent Neural Network*
Qingquan Lv; Ming Ma; Xuetao Jiang; Meiyu Jiang; Binbin Yong; Jun Shen; Qingguo Zhou

SmartCity-9: Smart City Services (I)

Session Chair: Yunzhi Xia, Huazhong University of Science and Technology, China

1. *UAV-USV Cooperative Task Allocation for Smart Ocean Networks*
Juan Liu; Zhou Su; Qichao Xu

2. *Analysis and Prediction Transient Population in Expressway Service Area Based Long Short-Term Memory*

Jin-Qiang Wang; Kai Zhang; Peng Zhi; Guolong Xi; Xiaorun Tang; Qingguo Zhou

3. *Remote Sensing Identification of Seasonal Pasture Based on Sentinel-2*
Shiqi Su; Panfei Fang; Pengfei Zheng; Rui Qian; Zhenping Qiang

4. *Lane-Level Traffic Flow Prediction Based on Dynamic Graph Generation*
Lingyun Wang; Guojiang Shen; Kaifeng Yu; Zhanhao Ji; Xiangjie Kong

5. *Citizen-Centric Smart Campuses: Supporting Events Information for People*
Xiaoyan Wei

SmartCity-10: Smart City Services (II)

Session Chair: Wei Xiang, Huazhong University of Science and Technology, China

1. *Personalized English Lexical Simplification for Chinese*
Yujie Yin; Feng Zhang; Yun Li; Jing Zhang; Jipeng Qiang

2. *Click Prediction Based on Feature Fusion and Attention Mechanism*
Guoning Zhao; Chunyang Ye; Qidi Zhang; Hui Zhou

3. *Research on Single Image Deraining Algorithm Based on Euclidean Distance With Adaptive Progressive Residual Network*
Xingzhi Chen; Ruiqiang Ma; Zehui Dong

SmartCity-11: Enabling Technologies for Smart City (II) (Short Paper)

Session Chair: Ziheng Xiao, Huazhong University of Science and Technology, China

1. *HANA-MES: A HMI-Awared Manufacturing Execution System*
Jingjing Chen; Hequn Wu; Yafei Li; Xiaoxin Wu; Yueqiang Zhao; Yao Shi; Songjia Tang; Yulun Shi; Hangyi Chen

2. *TSITE IP: A Case Study of Intellectual Property Distributed Platform Based on Cloud Services*
Yang Wang

3. *Infrared and Visible Image Fusion Based on Deep Gradient Constraint Driven Network*
Ze Wang; Guoxia Xu

4. *Performance Analysis of Turbo Codes for 5G Massive Machine-Type Communication(mMTC)*
Mohammed Jajere Adamu; Li Qiang; Rabi Sale Zakariyya; Adamu Halilu Jabire; Halima Bello Kawuwa; Sani Saminu

5. *Multigranularity Multiclass-Layer Markov Random Field Model for Improving Remote Sensing Image Classification*
Jun Wang; Haoyu Fu; Cheng Zhen; Leiguang Wang; Qinling Dai

6. *The Impact of Parameters on Semantic Segmentation: A Case Study on the CamVid Dataset*
Yue Zhang; Ruiqi Yang; Jun Wang; Nan Chen; Qinling Dai

SmartCity-12: Smart City Services (III) (Short Paper)

Session Chair: Ziheng Xiao, Huazhong University of Science and Technology, China

1. *Traffic Anomaly Detection Model of Electric Power Industrial Control Based on DBN-LSTM*
Shijun Zhang; Ji Lai; Qigui Yao

2. *Sentiments Affect Stock Returns: Evidence Based on Big Data*
Jing Sun; Yingying Xu; Yueqiang Zhao; Yuliang Zhou; Jaime Ortiz; Weipeng Chen

3. *Cascaded Based Adaptive R-CNN Network for Insulator Defect Detection*
Nan Yao; Guangrui Shan; Jianya Pan; Zhen Wang; Xueqiong Zhu

4. *An Improved Bi-LSTM Model for Entity Extraction of Intellectual Property Using Complex Graph*
Youning Wang; Qi Liu; Yang Wang

5. *Pluralistic Face Image Completion Based on StyleGAN*
Xiaofeng Shao; Zhenping Qiang; Fei Dai; Shiqi Su; Yuxuan Zuo; Libo He

SmartCity-13: Smart Systems (Short Paper)

Session Chair: Yixuan Geng, Huazhong University of Science and Technology, China

1. *Improved ORB Mismatch Elimination Based on Gradient Cosine*

Zhao Cheng Huang; Lei Liu; Lanyao Qin; Yonglin Huang; Sha Lan; Yi Xiang; Xiaopeng Xie; Changjin Guo

2. *Innovative Digital Twin Platform Construction for Smart Grid System*

Yiguo Zhong; Wei Zhang; Xueping Ha; Qinghai Chen; Jing Huang; Ke Yan

3. *A Handover Self-Optimization Mobility Load Balancing for Ultra-Dense Networks*

Yujie Li; Zhoujin Tang; Jian Sun; Xiaolong Yang; Shuo Chen

The DSS 2021 Physical Presentation Program

DSS-1: Data Science and Systems

Session Chair: Zecan Yang, Huazhong University of Science and Technology, China

1. A Convolutional Generative Adversarial Framework for Data Augmentation Based on a Robust Optimal Transport Metric

Liyilei Su; Xianjun Fu; Qingmao Hu

2. An Emotion Guidance Decision-Making Model Based on Dialogue Context

Zhiqiang Ma; Wenchao Jia; Baoxiang Du; Chunyu Wang

3. BRB-Based Distributed Fault Diagnosis for Consensus of Heterogeneous Multi-Agent Systems

Ruohan Yang; Zhichao Feng

4. Local-Global-Aware Convolutional Transformer for Hyperspectral Image Classification

Yifan Wang; Zhichao Min; Sen Jia

5. Chinese Relation Extraction of Apple Diseases and Pests Based on A Dual-Channel Neural Network

Mei Guo; Jiayu Zhang; Mei Li; Yaojun Geng; Nan Geng

6. Digital Twin Mobility Profiling: A Spatio-Temporal Graph Learning Approach

Xin Chen; Mingliang Hou; Tao Tang; Achhardeep Kaur; Feng Xia

DSS-2: Data Science and Systems (Short Paper)

Session Chair: Zecan Yang, Huazhong University of Science and Technology, China

1. Organs-At-Risk Segmentation in Medical Imaging Based on the U-Net With Residual and Attention Mechanism

XiaoWei Lin; Ni Li; Qi Qi

2. Multiscale Spatial-Spectral Joint Feature Learning for Multispectral and Hyperspectral Image Fusion

Zhichao Min; Yifan Wang; Sen Jia

3. Spatial-Temporal-Spectral Transformer for 3D Human Pose Estimation

Yongpeng Wu; Dehui Kong; Shaofan Wang; Jinghua Li; Baocai Yin

The DependSys 2021 Physical Presentation Program

DependSys-1: Security Fundamentals and Technologies

Session Chair: Yuan Gao, Huazhong University of Science and Technology, China

1. Application of Deep Reinforcement Learning in Optimization of Traffic Signal Control

Jian Huang; Wei Wang; Lirong Wang; Hui Chen; Qingshan Deng; Heying Fan; Yaohua Yu

2. An Improved Slime Mould Algorithm with Quasi Reflection-Based Learning for Global Optimization Problems

Qingxin Liu; Qi Qi; Heming Jia; Ni Li

3. Multi-objective Optimization Regression Verification for Multi-core Cache Coherence Protocol

Li Luo; Ying zhang; Hongjun He; Lei Wang; Changqing Xun; Guoteng Pan; Junbo Tie; Huili Hu

4. Parallel LSTM Enhanced Forecasting System for Dependable and Secure Household Energy Consumption

Ke Yan; Fan Yang; Xiaokang Zhou; Wei Liang

DependSys-2: Security Fundamentals and Technologies (Short Paper)

Session Chair: Xin Nie, Huazhong University of Science and Technology, China

1. Study on Active Defense of Honeypot-Based Industrial Control Network

Xunsi Wei; Dequan Yang

2. Design of Functional Safety Pressure Transmitter and Safety Assessment

Bingjun Yan; Xiufang Zhou; Bo Zhang; Zhiping Wang

3. A Survey on Failure Prediction in Large-scale Computing Systems

Fei Xia; Hu Song; Long-Chuan Yan; Yan Li; Li-Jun Wang

The GPC 2021 Physical Presentation Program

GPC-1: Intelligent Sensing and Computing

Session Chair: Bocheng Ren, Huazhong University of Science and Technology, China

1. *Local Interaction and Global Guidance Based Low and High-Level Feature Fusion for RGB-D Fixation Prediction*

Xinyue Zhang; Ting Jin; Mingjie Han; Jingsheng Lei

2. *HuMachineSensing: A Novel Mobile Crowdsensing Framework with Robust Task Allocation Algorithm*

Yixuan Luo; Zhiwen Yu; Jiaju Ren; Bin Guo

3. *PipePrune: Pipeline Parallel Based on Convolutional Layer Pruning for Distributed Deep Learning*

Daojun Tan; Wenbin Jiang; Shang Qin; Hai Jin

4. *Cooperative Relationship Prediction Between Scholars in Heterogeneous Academic Network*

Jia Shi; Hai Jin; Xia Xie

5. *A Novel Optimized Asynchronous Federated Learning Framework*

ZhiCheng Zhou

6. *Forwarding Policy Verification of Hybrid Multi-Domain Software Defined Network*

Jiangyuan Yao; Zheng Jiang; WeiPing Yang; Minrui Wang; Deshun Li

GPC-2: Pervasive and Green Applications (I)

Session Chair: Ning Zhang, Huazhong University of Science and Technology, China

1. *MetaProfiling: Inferring User Profiles With Few-Shot Data*

Yueqi Sun; Bin Guo; Nuo Li; Yi Ouyang; Xiaona Li; Jiayu Xie; Zhu Wang; Zhiwen Yu

2. *Joint Energy and Computation Workload Management for Geo-Distributed Data Centers in Smart Grid*

Zizhen Li; Ran Wang; Kun Zhu; Changyan Yi; Linfeng Liu; Dusit Niyato

3. *Quantitative Assessment of Limb Stability From Handwriting Images*

Zhifei He; Luchuan Zeng; Ruijiang Xie; Keyi Li; Hai Su; Jie Lei; Lan Li; Linglin Xia; Deyu Lin

GPC-3: Pervasive and Green Applications (II) (Short Paper)

Session Chair: Bocheng Ren, Huazhong University of Science and Technology, China

1. *Exploring Self-Supervised Learning for Radio Signal Recognition*

Xingtong Yun; Xin Zhou

2. *A Novel CNN-LSTM Method for Ship Trajectory Prediction*

Bingqing Lu; Rongheng Lin; Hua Zou

3. *Optimization Strategy for Time-Of-Use Tariffs on the Electricity Generation-Sales Side Considering Customer Demand Response*

Zhuoran Kang; Rongheng Lin; Hua Zou; Xiaowei Liu; Rui Jiao

4. *Modeling Analysis Based on Live Broadcast Paid Gifting Behavior*

Na Wang; Zhiwen Yu; Bin Guo

5. *A Dynamic Routing Strategy for Hybrid Power Communication Networks*

Zengqing Qi; Jingpeng Xiao; Zhiqiang Xu

The DIKW 2021 Physical Presentation Program

DIKW-1: Artificial Intelligence

Session Chair: Wei Xiang, Huazhong University of Science and Technology, China

1. *A Method for Improving the Effect of Base Station Energy Saving With AI*
Jingjing Yuan; Le Zhang; Tiantian Lv; Yanqin Wu
2. *Purpose Driven Balancing of Fairness for Emotional Content Transfer over DIKW*
Ting Hu; Yucong Duan; Yingtian Mei
3. *Sentiment Analysis Method Based on Deep Learning in Adversarial Environment*
Jiamin Lv; Lei Yu; Yucong Duan
4. *MDistMult: A Multiple Scoring Functions Model for Link Prediction on Antiviral Drugs Knowledge Graph*
Weichuan Wang; Zhiwen Xie; Jin Liu; Yucong Duan; Bo Huang; Junsheng Zhang
5. *Construction and Optimization of Medical Question Answering System Based on Knowledge Graph*
Bing Gao; Haoxiong Wang; Qijie Zou; Jing Qin

DIKW-2: Networks, Algorithms and Graph

Session Chair: Bocheng Ren, Huazhong University of Science and Technology, China

1. *Long-Term Change Characteristics and Mechanism Analysis of Salinity in Section B1 of Bohai Sea*
Yan Li; Huaming Yu, Xuechao Zhang; Ge Li; Min Bao
2. *A Study on the Health Status of Cherry Production in Multi-Factor Facilities Based on the Attention Mechanism Bi-LSTM*
Chao Zhang; Lingyan Hu; Zumin Wang; Yan Liu; Zhanjun Guo; Guoqiang Li
3. *Cherry Detection Algorithm Based on Improved YOLOv5s Network*
Rongli Gai; Mengke Li; Na Chen
4. *Research on Acceleration and Deceleration Control Algorithm of S-Curve*
Rongli Gai; Yitong Guo

DIKW-3: Blockchain

Session Chair: Minghua Wang, University of South China, China

1. *A Multiple-Blockchains Based Service Monitoring Framework in Edge-Cloud Computing*
Hang Fu; Puwei Wang; Ying Zhan; Jinchuan Chen; Xiaoyong Du
2. *Recognize Illegal Transactions in the Bitcoin Network Using Graph Convolution with DIKW*
Haixiao Zheng; Bin Wen; Yuhan Li
3. *Data and Information Fusion Oriented Outline Driven Framework for Clause Extraction from Electronic Insurance Contracts*
Zhifeng Duan; Bin Xu; Zhengwu Wu; Yucong Duan; Chengxiang Ren
4. *A Power Consumption Perception and Dynamic Adjustment Model for Embedded Real-Time Systems*
Yingjie Wang; Fengbo Bai; Zumin Wang; Zixu Wang; Zizhong Wang
5. *A Study on 3D Multimodal Resonance Brain Tumor Image Segmentation Model*
Lei Dong; Zumin Wang; Min Zhang; Bing Gao

DIKW-4: Data-Information-Knowledge-Wisdom (Special Invited Session Papers)

Session Chair: Wei Xiang, Huazhong University of Science and Technology, China

1. *DIKW Upward Enabling Manufacturing from Digitalization in Industry 3.0 to Wisdom in Industry 4.0*
Xifan Yao; Kesai Wang; Nanfeng Ma; Haifeng Mai; Yansong Huang; Erfu Yang
2. *Analysis of Evolutionary Model of DIKW Based on Cloud Resource Allocation Management*

Hongyu Qiao; Lei Yu; Yucong Duan

3. Reconstruction of Smart Meteorological Service Based on DIKW

Liang Chen; XiaoWen Wei; ShengBei Chen; Yucong Duan

4. How Do We Move Towards True Artificial Intelligence

Wei Liu; Guangda Zhuang; Xin Liu; Shaobo Hu; Ruilin He; Yuhu Wang

5. Innovative Evaluation Model Based on Improved AHP Weighted Principal Component Analysis

Yu Zhang

**DIKW-5: Analysis and Natural Phenomena (Special Invited Session Papers and Short Paper)
Session Chair: Ziheng Xiao, Huazhong University of Science and Technology, China**

1. Research on Moving Target Detection in Complex Weather

Zhaoqi Yan; Rongli Gai

2. Research of Seismic Streaming Storage Based on Druid

Bing Gao; Jie Chen; Qijie Zou; Jing Qin

3. Characteristics of 26 Strong Long-Lived Convective Cells in Shandong

Feiyan Guo; Xiuguang Diao; Han Yao; Huaji Pang; Manman Xing

4. Modeling Data, Information and Knowledge for Security Protection of Tasks Scheduling Algorithms in Cloud Computing

Linxuan Xin; Jiantao Zhou; Lei Yu

5. Applying of Graph Neural Network in Relationship Prediction in Knowledge Graph Reasoning

Jiahao Li; Wenbo Xu

DIKW-6: Weather Forecast (Short Paper)

Session Chair: Yunzhi Xia, Huazhong University of Science and Technology, China

1. Evaluation of ART_V1.0 and ART_V1.1 Datasets Over Hainan Island and South China Sea

Yi Jiang; Chunxiang Shi; Shuai Han; Zihao Pang; Honghui Zheng

2. Application Research of Naive Bayes Algorithm Based on DIKW in Weather Website

ChaoNing Li; Liang Chen; Shenghong Wu; Yunyin Mo; Liying Chen

3. Analysis of a Severe Convective Weather Process Based on Potential Vorticity Theory on 13 June 2018

Huaji Pang; Han Yao; Feiyan Guo; Fujing Wan; Shudong Wang; Guoping Zhang

4. Supercell Storm and Extreme Wind in a Linear Mesoscale Convective System

Fujing Wan; Zhifeng Liu; Huaji Pang

5. Lightning Prediction and Environment Factor Analysis Using Random Forest Algorithm in Shandong Province, China

Han Yao; Feiyan Guo; Lin Song; Huaji Pang

DIKW-7: Database Performance (Short Paper)

Session Chair: Honglu Zhao, Fujian Agriculture and Forestry University, China

1. A Method for Identifying Customer Business Application Scenarios of Cloud Dedicated Access

Tiantian Lv; Yanqin Wu; Le Zhang; Jingjing Yuan

2. Distributed HBase Cluster Storage Engine and Database Performance Optimization

Hao Zhang; Rongli Gai

3. Survey of Performance Comparison Based on Non Relational Database

Jingbo Li; Rongli Gai

4. *Survey on Query Optimization of GPU Database*
Jiahui Yang; Rongli Gai; Liming Duan

DIKW-8: Wind Forecast (Short Paper)

Session Chair: Zecan Yang, Huazhong University of Science and Technology, China

1. *Wind Speed Forecasting Method Based on Deep Learning Strategy Using Long Short Term Memory Neural Network and Transformer Model*

Zhifeng Liu; Feng Ding; Fujing Wan

2. *Analysis of the Impact of Offshore Wind Power Development on Marine Ecological Environment Based on Observation Data*

Yanni Wang; Huaming Yu; Yaocheng Deng; Ge Li; Min Bao; Zhuan Zhou

3. *Comparative Experiment of Several Quantitative Precipitation Estimation Techniques Based on Doppler Radar Over the Hainan Island During Typhoon*

Lingyu Dong; Xiaobin Lin

4. *Improvement of the Data Assimilation Scheme for Sea Surface Wind Speed Products*

Xiaoyan Liu; Bin Xu; Zhihong Liao; Chunxiang Shi

DIKW-9: Data-Information-Knowledge-Wisdom (Short Paper)

Session Chair: Yunzhi Xia, Huazhong University of Science and Technology, China

1. *Service Recommendation Based on DIKW Pyramid*

Jiamin Lv; Lei Yu; Yucong Duan

2. *Fairness Modelling, Checking and Adjustment for Purpose Driven Content Filling Over DIKW*

Yue Huang; Yucong Duan

3. *Purpose-Driven Content Network Transmission Protocol Crossing DIKW Modals*

Yuxiao Lei; Yucong Duan

4. *Summary of Water Quality Prediction Models Based on Machine Learning*

Rongli Gai; Jiahui Yang

5. *The Application of Augmented Reality Technology in Museum Display Design*

Junjie Zhang; Jianru Shang; Hong Yan

The Hyper-Intelligence Congress 2021

IEEE HPCC/SmartCity/DSS/DependSys/GPC/DIKW-2021

Online Presentation Program

Monday December 20, 2021 (China Standard Time CST, UTC+8)

09:00-10:00	Opening Ceremony	
10:00-10:20	Coffee Break	
10:20-11:00	Keynote 1: IT/OT Fusion and Next Generation Industrial Software Linfu Sun , Southwest Jiaotong University, China Chaired by Bing Guo, Sichuan University, China	
11:00-11:40	Keynote 2: Advanced Applications of Brain Science + AI + Grid Edge Supercomputing Steve Chen , 3rd Brain Research Institute, USA Chaired by Rong Gu, Nanjing University, China	
11:40-12:20	Keynote 3: Beef Up the Edge: Building a Service Network for Sensing, Communications, Computing, Storage and Intelligence at the Edge Yuguang “Michael” Fang , University of Florida, USA Chaired by Xiaokang Wang, St. Francis Xavier University, Canada	
12:20-14:30	Lunch Break	
14:30-15:10	Keynote 4: AI Everywhere: From Cloud Computing to Edge Computing Wayne Dai , VeriSilicon, China Chaired by Huazhong Liu, Hainan University, China	
15:10-15:50	Keynote 5: Deep Learning-Based Vulnerability Detection for Open-Source Software Deqing Zou , Huazhong University of Science and Technology, China Chaired by Xianjun Deng, Huazhong University of Science and Technology, China	
15:50-16:30	Keynote 6: Edge Intelligence – Engineering the New Fabric of IoT, Edge, and Cloud Schahram Dustdar , Vienna Technical University, Austria Chaired by Qingchen Zhang, Hainan University, China	
16:30-16:50	Coffee Break	
16:50-17:30	Keynote 7: Practice and Exploration of Industry and Finance Platform Based on the IoT Gang Xia , CEC Industrial Internet, China Chaired by Hua Li, Hainan University, China	
17:30-18:10	Keynote 8: 5G-Lead, Data & Intelligence-Driven, Digital Twins Shape the New Pattern of Smart City Jinzhou Yang , China Unicom, China Chaired by Bang Wang, Huazhong University of Science and Technology, China	
18:10-19:30	Reception	
Room	Room 1/2/3/4/5/6 (Physical)	Room 7 (Online)
18:10-19:50		SmartCity-14: Smart City Technologies (I)
19:50-20:05		Coffee Break
20:05-21:55		SmartCity-15: Big Data and Smart Systems (I)

Tuesday December 21, 2021 (China Standard Time CST, UTC+8)

Room	Room 1/2/3/4/5/6 (Physical)	Room 7 (Online)
8:00-9:40		Hyper-Intelligence-1: High Performance Computing and Smart Data (I)
9:40-9:55		Coffee Break
9:55-11:35		SmartCity-16: Smart City Technologies (II)
11:35-11:50		Coffee Break
11:50-13:30		Hyper-Intelligence-2: Smart Systems and Data Science (I)
13:30-13:45		Coffee Break
13:45-15:25		SmartCity-17: Big Data and Smart Systems (II)
15:25-15:40		Coffee Break
15:40-17:20		Hyper-Intelligence-3: High Performance Computing and Smart Data (II)
17:20-17:35		Coffee Break
17:35-19:15		Hyper-Intelligence-4: Communications and Data Processing (I)
19:15-20:00		Awards Ceremony

Wednesday December 22, 2021 (China Standard Time CST, UTC+8)

Room	Room 1/2/3/4/5/6 (Physical)	Room 7 (Online)
8:00-9:40		Hyper-Intelligence-5: Smart Systems and Data Science (II)
9:40-9:55		Coffee Break
9:55-11:35		Hyper-Intelligence-6: Data Applications and Security (I)
11:35-11:50		Coffee Break
11:50-13:30		Hyper-Intelligence-7: Communications and Data Processing (II)
13:30-13:45		Coffee Break
13:45-15:25		Hyper-Intelligence-8: Data Applications and Security (II)
15:25-15:40		Coffee Break
15:40-17:20		HPCC-26: Smart Computing
17:20-19:30		Dinner Break
19:30-21:10		DIKW-10: Artificial Intelligence and Knowledge

The Hyper-Intelligence Congress 2021

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Online Presentation Program

SmartCity-14: Smart City Technologies (I) (Regular Paper)

Session Chair: Yuanyuan He, Huazhong University of Science and Technology, China

1. *Short-Term Traffic Flow Forecast Using Regression Analysis and Graph Convolutional Neural Networks*
Daniel Klosa; Amin Mallek; Christof Büskens

2. *Towards Applying IPsec Between Edge Switches and End Users to Counter DDoS Attacks in SDNs*
Abdullah Soliman Alshra'a; Jochen Seitz

3. *Intelligent Question Answering System Based on Knowledge Graph*
Xijin Feng; Qi Liu; Xiaodong Liu

4. *Rethinking Deep Packet Inspection Design and Deployment in the Era of SDN and NFV*
Hanan Mustapha; Soufiene Djahel; Philip Perry; Zonghua Zhang

SmartCity-15: Big Data and Smart Systems (I) (Short Paper)

Session Chair: Weifeng Zhong, Guangdong University of Technology, China

1. *An Ontology for an IoT-Enabled Smart Library in a University Campus*
Soulakshmee Devi Nagowah; Hatem Ben Sta; Baby Ashwin Gobin-Rahimbux

2. *Implementation of a Smart Canteen System for a University Campus*
Jaya Laxmi Ramiah; Soulakshmee Devi Nagowah

3. *Developing an Integrated Data Model Based on IFC and SensorML for Post-COVID Facility Management*
Vincent J.L. Gan; Tao Wang; Difeng Hu; Chao Yin

4. *Intelligent and Automated Fault Detection and Diagnosis Strategy for HVAC Systems Based on Maintainability Rules for Construction 4.0*
Michael Chew; Ke Yan

HYPER-INTELLIGENCE-1: High Performance Computing and Smart Data (I) (Regular Paper)

Session Chair: Yuanyuan He, Huazhong University of Science and Technology, China

1. *HyperOXN: Topology and Scheduling for Efficient Large-Scale Networks*
Timothy Yuan; Dan Ionescu

2. *QHash: An Efficient Hashing Algorithm for Low-Variance Image Deduplication*
Xuan Li; Liqiong Chang; Xue Liu

3. *Characterization and Implication of Edge WebAssembly Runtimes*
Zhen Wang; Jianda Wang; Zhendong Wang; Yang Hu

4. *Smart City Traffic Intersection: Impact of Video Quality and Scene Complexity on Precision and Inference*
Zhuoxu Duan; Zhengye Yang; Richard Samoilenko; Dwiref Snehal Oza; Ashvin Jagadeesan; Mingfei Sun; Hongzhe Ye; Zihao Xiong; Gil Zussman; Zoran Kostic

5. *An Ensemble-Based Weight-Learning Framework and Algorithm for Imputing Missing Values on High-Dimension Low-Sample Size Datasets*
Chun-Kit Ngan; Boyuan Yang

6. *Knowledge Engineering in the Social Era*
Ejub Kajan; Zakaria Maamar

SmartCity-16: Smart City Technologies II (Regular Paper)**Session Chair: Xiao Tang, University of South China, China**

1. *A Comprehensive Overview on IoT-Based Smart Stroke Rehabilitation Using the Advances of Wearable Technology*

Najmeh Razfar; Rasha Kashef; Farah Mohammadi

2. *Deep Learning-Based Semantic Segmentation in Autonomous Driving*

Hrag Harout Jebamikyous; Rasha Kashef

3. *Assessing Stroke Patients Movements Using Inertial Measurements Through the Advances of Ensemble Learning Technology*

Najmeh Razfar; Rasha Kashef; Farah Mohammadi

4. *Big Data Mining on Health Informatic Data for Cities*

Carson K. Leung; Qi Wen; Chenru Zhao

5. *Design and Implementation of a Distributed Control Platform for a Smart Building Testbed*

Nathan Puryear; Mostafa Zaman; Roja Eini; Sherif Abdelwahed

HYPER-INTELLIGENCE-2: Smart Systems and Data Science (I) (Regular Paper)**Session Chair: Xiao Shen, Hainan University, China**

1. *APT: A Buzzword and a Reality--A Bibliometric Review of the Literature (2010-2020)*

Budi Aditya Bhat; Rajesh Kumar

2. *TAGCN: Typed Attention Graph Convolutional Networks for Entity Alignment in Cross-Lingual Knowledge Graphs*

Jianliang Gao; Zhao Li; Fan Xiong; Xiangyue Liu; Jie Xiao; Biao Wang; Ji Zhang

3. *Automatic Semantic Modeling for Structural Data Source with the Prior Knowledge from Knowledge Graph*

Zaiwen Feng; Jiakang Xu; Wolfgang Mayer; Wangyu Huang; Keqing He; Markus Stumptner; Georg Grossmann; Hongyu Zhang; Lin Ling

4. *Multi-Agent Deep Reinforcement Learning Based Consistency Control in Train Platoon Systems*

Xinran Zhang; Gaofeng Nie; Wanli Ni; Hui Tian

SmartCity-17: Big Data and Smart Systems (II) (Regular Paper)**Session Chair: Yinxue Yi, Chongqing University of Posts and Telecommunications, China**

1. *On-Camera Content Filtering for Real-Time Video Analytics*

Fahao Chen; Peng Li; Celimuge Wu

2. *Fault Diagnosis of Rolling Bearing Using Multiscale Fusion Convolutional Neural Network*

Mengyuan Ren; Yiming He; Qiang Wang; Jingtao Sun

3. *Driving Gaze Behavior Prediction at S-Curve Based on Driver Experience Using Machine Learning*

Chrispus Oroni; Yishui Zhu; Luyang Wang; Bo Wu

4. *Intelligent Live Video Streaming for Object Detection*

Mingkang Chen; Jingtao Sun; Kento Aida; Renato Figueiredo; Yun-Jung Ku; Kensworth Subratie

5. *Classifying Dominant Tree Species Over a Large Mountainous Area Based on Multi-Temporal Sentinel-2 Data*

Pengfei Zheng; Panfei Fang; PeiWei Liu; Qinling Dai; Jin Li

HYPER-INTELLIGENCE-3: High Performance Computing and Smart Data (II)**Session Chair: Weiting Zhang, Beijing Jiaotong University, China**

1. *Short-Term Financial Data Prediction by Long-Term Regression*

Mahmoud. Mesleh; Mustafa Serkan Kiranyaz

2. *Convex Non-Negative Matrix Factorization Through Quantum Annealing*
Zaiou Ahmed; Matei Basarab; Bennani Younès; Hibti Mohamed

3. *A Filter is Better Than None: Improving Deep Learning-Based Product Recommendation Models by Using a User Preference Filter*
Miguel Alves Gomes; Hasan Tercan; Todd Bodnar; Philipp Meisen; Tobias Meisen

4. *A Case-Based Reasoning Solution for Computational Urban Drinking Water Quality Control*
Di Wu; Hao Wang; Razak Seidu; Xiaojuan Ban

5. *A Deep Learning Approach for Intrusion Detection*
Roua Dhahbi; Farah Jemili

6. *Global Definition of Information for Global Communication*
Wolfgang Orthuber

Hyper-Intelligence-4: Communications and Data Processing (I) (Regular Paper)
Session Chair: Weijun Wang, University of Goettingen, Germany

1. *MGGAN: Improving Sample Generations of Generative Adversarial Networks*
Hao Wu; Ligang He; Chang-Tsun Li; Junyu Li; Wentai Wu; Carsten Maple

2. *On-The-Fly Servers Placement for Online Multiplayer Games in the Fog*
Amira Rayane Benamer; Hadj-Alouane Nejib; Boussetta Khaled

3. *Automated Human Activity Recognition by Colliding Bodies Optimization(CBO)-Based Optimal Feature Selection with RNN*
Ayan Chatterjee; Ayan Chatterjee; Matrika Subedi

4. *Perceiving the Narrative Style for Fake News Detection Using Deep Learning*
Mengtao Sun; Ibrahim Hameed; Hao Wang; Mark Pasquine

5. *Collaborative Random Forests Learning*
Yohan Foucade; Younes Bennani; Zakaria Aabbou

DIKW-10: Artificial Intelligence and Knowledge (Short Paper and Special Invited Session Papers)
Session Chair: Jiawei Wang, St. Francis Xavier University, Canada

1. *A Geometrical Deep Learning Model for the Lexicalisation of "Unseen" RDF Triples*
Marco Cremaschi; Simone Saleri; Andrea Maurino

2. *Invited Speech: Data Analytics and (Interpretable) Machine Learning for Social Good*
Riccardo Martoglia

3. *Let the Games Speak by Themselves: Towards Game Features Discovery Through Data-Driven Analysis and Explainable AI*
Riccardo Martoglia; Matteo Pontiroli

4. *Revisiting Data-Information-Knowledge-Wisdom Hierarchy from a Logic Perspective*
Mykola Nikitchenko

5. *Reasoning and Evolution of Perceptions. the Influence of Color, on Brand's Logo in Malaysia*
Firend Al Rasch; Narcisa Roxana Mosteanu; Lee Yee Sheng

Hyper-Intelligence-5: Smart Systems and Data Science (II) (Short Paper)
Session Chair: Junyu Lu, Sichuan university, China

1. *RoboMaze: Swarm Robotics and Coordinated Navigation in Smart City*
John Song; Austin Z Song; Fumin Zhang

2. *Deep Learning Transforming the Manufacturing Industry, A Case Study*

Hafiz Mughees Ahmad; Afshin Rahimi; Khizer Hayat

3. *Learning Performance Efficiency of College Basketball Players*
Nasim Yahyasoltani; Manzur Farazi; Priyanka Annapureddy

4. *An LWE-Based Multi-Key Privacy-Preserving Distributed Deep Learning*
Emmanuel Antwi-Boasiako; Shijie Zhou; Yongjian Liao; Ebenezer Kwaku Danso

Hyper-Intelligence-6: Data Applications and Security (I) (Regular Paper)
Session Chair: Cheng Dai, Sichuan university, China

1. *Efficient Comorbidity Analysis in Brain Disorders Reveals Better Diagnosis*
Menglu Li; Maryam Amirizani; Rasha Kashef

2. *Enhance COVID-19 Mortality Prediction With Human Mobility Trend and Medical Information*
Yogesh Chaudhari; Indrajeet Javeri; Ismailcem Arpinar; John A. Miller; John A. Miller Li; Bingnan Li; Yuan Ke; Mohammadhossein Toutiaee; Nicole Lazar

3. *Behavioural Monitoring and Security Profiling in the Internet of Things (IoT)*
Miraqa Safi; Barjinder Kaur; Sajjad Dadkhah; Farzaneh Shoeleh; Arash Habibi Lashkari; Heather Molyneaux; Ali A. Ghorbani

4. *False Data Injection Attack Detection Based on Wavelet Packet Decomposition and Random Forest in Smart Grid*
Zhenyu Chen; Shuai Yuan; Longfei Wu; Zhitao Guan; Xiaojiang Du

5. *A Data-Driven Password Strength Meter for Cybersecurity Assessment and Enhancement*
Moath M. Algharibeh; Ghaith Husari; Sardar Jaf

Hyper-Intelligence-7: Communications and Data Processing (II) (Short Paper and Special Invited Session Papers)

Session Chair: Weiting Zhang, Beijing Jiaotong University, China

1. *TLM-NoC: Two Level Mesh Network-On-Chip for Performance Improvement*
Gagan N; Biswajit Bhowmik

2. *Machine Singing Generation Through Deep Learning*
Risira Daksith Jayasinghe

3. *An Allocation Method of Crowdsourcing Tasks for Protecting Fairness of Participants*
Lei Xiao; Zhigang Gao; Ruichao Xu; Bo Wu; Leilei Zheng; Wei Zhao; Weipeng Cen; Xuanzhang He

4. *Service Design With Machine Learning Based on User Action History (Comparison and Visualization of Differences in Running Motion With Dynamic Time Warping)*
Xinyue Wang; Nobutada Fujii; Ruriko Watanabe; Daisuke Kokuryo; Toshiya Kaihara

5. *Keynote: Computing Amplification Factors for Influence on Social Network Based on Learning of Behaviors and Interacted Knowledge Graph*
Hien D Nguyen; Quan M Tran; Vuong Pham; Tai Huynh

6. *Intelligent Black Ice Detection and Alert System Using Thermal Imaging Camera and Drone*
Yanan Xu; Dexiang Yao; Xue Ren; Yunhai Dai

Hyper-Intelligence-8: Data Applications and Security (II)

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

1. *Three Edge-Disjoint Hamiltonian Cycles in Crossed Cubes With Applications to Fault-Tolerant Data Broadcasting*
Kung-Jui Pai; Ro-Yu Wu; Sheng-Lung Peng; Jou-Ming Chang

2. A Spatial-Temporal Model for Tourism Demand Forecasting

Yunxuan Dong; Binggui Zhou; Guanghua Yang; Fen Hou; Shaodan Ma

3. Migrating Deep Learning Data and Applications among Kubernetes Edge Nodes

Suchanat Mangkhangcharoen; Jason Haga; Prapaporn Rattanatamrong

4. QHSL Image Encryption Scheme Based on a Logistic Chaotic System

Fei Yan; Mao Li; Nianqiao Li; Abdullah M. Ilyasu

5. Multi-Agent Deep Reinforcement Learning for Traffic Signal Control With Nash Equilibrium

Wei Wei; Qiang Wu; Jianqing Wu; Bo Du; Jun Shen; Tinghong Li

HPCC-26: Smart Computing (Short Paper and Special Session)

Session Chair: Shenghao Liu, Huazhong University of Science and Technology, China

1. Execution- and Prediction-Based Auto-Tuning of Parallel Read and Write Parameters

Megha Agarwal; Pragya Jain; Divyansh Singhvi; Preeti Malakar

2. Energy Efficient and QoS Aware Multi-Level Mobile Cloud Offloading

Vaibhav Gupta; Aryabartta Sahu; Chinmaya Kumar Swain

3. pmcEDF: An Energy Efficient Procrastination Scheduler for Multi-Core Mixed Criticality Systems

Louella Colaco; Amol Pai; Biju K Raveendran; Sasikumar Punnekkat

4. Efficient Welfare Maximization in Fog-Edge Computing Environment

Avadhesh Sharma; Aryabartta Sahu; Chinmaya Kumar Swain

5. Machine Learning Based Thread Pool Tuning via Program Analysis

Lakindu Akash; Duneesha Fernando; Malith Jayasinghe; Chamath Keppitiyagama; Kishanthan Thangarajah

6. Transparency-Privacy Trade-off in Blockchain-Based Supply Chain in Industrial Internet of Things

Muhammad Islam; Mubashir Husain Rehmani; Jinjun Chen

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