6th EAI International Conference on 6G for Future Wireless Networks

October 7-8, 2023, Shanghai, China

EAI 6GN 2023

Conference Program

Organized by
School of Electronics Information
Shanghai Dianji University

EAI
RESEARCH MEETS INNOVATION

上海电机学院建校70周年
The 70th Anniversary of
Shanghai DianJi University

Welcome Message from the General Chairs

Welcome to the 6th EAI International Conference on 6G for Future Wireless Networks (6GN) held from October 7th to October 8th 2023 at Shanghai City of P.R.China. On behalf of the Organizing Committee of 6GN 2023, we would like to express our sincere and warm welcome to all participants! EAI 6GN 2023, conference is the sixth edition of the International Conference on key technology enablers for 5G/B5G/6G and other wireless networks.

With the pace of the conference, today we came to Shanghai Dianji University. Shanghai Dianji University is a public university which is focused on the cultivation of students with strong practical skills, and the key specialty is engineering. Shanghai Dianji University adheres to the "Technology-Centered, Application-Oriented" educational ideology. Shanghai Dianji University commit to cultivating "Excellent Field Engineers" with solid technical theory foundation and strong technical practical ability, who can be engaged in technical application, technical management and technical service in the production line.

The promotion and popularization of the fifth generation (5G) technology has become a symbol of The Times in the telecommunications industry. Enhanced mobile broadband (eMBB), Ultra-reliable & Low Latency Communication (uRLLC), and Massive Machine Type of Communication (mMTC) are no longer long-term goals in the eyes of scholars, but practical technologies in the hands of engineers. Taking this opportunity, this conference will further research and discuss the Power and Energy Systems, Communications Systems and Networking, Computer Systems and Applications and other aspects. We look forward to the full two-day program,which includes many productive discussions and demonstrations, can contribute to the future of 5G/B5G/6G communications and networks.

For the successful organization of an international conference of this size and diversity, we counted on the great support of many people and organizations. We would like to sincerely thank the EAI and 6GN Steering Committee, Organizing Committee for giving us the opportunity to organize the conference and for their support and guidance. We would like to express our appreciation to all invited speakers for offering wonderful speeches.

We thank all of you for participating in 6GN 2023.We sincerely hope 6GN 2023 can stimulate your innovation and future research and play as a platform for your professional activities.

General chair:

Welcome Message from the TPC Chairs

The 6th EAI International Conference on 6G for Future Wireless Networks (6GN 2023) will be held from October 7th to October 8th 2023 at Shanghai City, P.R. China. Firstly, we would like to express our great welcome and thank to all the participants. Welcome to Shanghai, a city full of culture and enthusiasm.

As we all know, the promotion and popularization of the sixth generation (6G) technology has become a symbol of The Times in the telecommunications industry. But that's never the end, the following B5G/6G will drive another wave of new trends, not only to optimize the spectrum and spatial bandwidth, but also to create more new technologies and applications, such as Taking this opportunity, this conference will further research and discuss the Power and Energy Systems, Communications Systems and Networking, Computer Systems and Applications. Moreover, the opportunities and challenges of 5G/B5G/6G are continuing to attract the attention of academics, industries, and governments. EAI 6GN 2023 provides high quality original research papers describing recent and expected challenges or discoveries along with potential intelligent solutions for 5G/B5G/6G.

Now, we'd like to announce that the keynote speakers of this year are: Prof. Cesar Briso, (Technical University of Madrid, SPAIN), Prof. Peng Chen, (Southeast University, China) and Prof. Jingchao Li (Shanghai Dianji University, China). We received 173 papers. After being reviewed by scholars organized by the Technical Committee, we selected 64 papers from universities and research institutions such as Shanghai Dianji University, Kanagawa University, and Harbin Engineering University. The acceptance rate was 37%, and the final registered paper was 60 articles with a registration rate of 93.8%. The papers cover multiple technical fields such as D2D Communication for 6G Networks, Power and Energy Systems, Security and Privacy for 6G Networks, and Intelligent Systems.

The technical program team did an excellent job in soliciting submissions, coordinating the review process, and promoting the technical program. We would like to thank every one of them for taking leadership roles in organizing the various aspects of the technical program.

Also we would like to express our thanks to all members of the organizing committee and all the volunteer reviewers who have been working hard days and nights for this conference.

Technical Program Committee Chairs:

Prof. Yudong Zhang

Prof. Peng Chen

Prof. Jingchao Li

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Program Schedule of 6GN 2023 (October. 7-8, Shanghai Dianji University, Shanghai)

Day 0 (October. 6): Registration

13:00-20:00	School of Electronic Information Building, Shanghai Dianji University

Day 1 (October. 7): Keynotes and Technical Sessions

Opening & Keynotes - Room 330, Administration Building, Shanghai Dianji University			
09:00-09:30	Opening		
09:30-09:45	Photo together for attendees		
09:45-10:00	Coffee Break		
10:00-11:30	Keynote I: Cesar Briso Keynote II: Peng Chen Keynote III: Jingchao Li		
11:45-12:45	Lunch——Floor 2, Second Restaurant		
Regular Sessions – Floor 5, School of Electronic Information Building			
	Room A	**Room B**	**Room C**
14:00-15:40	*S1：Intelligent Systems*	*S2：Big data mining, D2D Communication, Security and Privacy for 6G Networks*	*S9：Computer Systems and Applications*
15:40-16:00	Coffee Break		
16:00-17:30	*S3：Artificial intelligent techniques for 6G Networks*	*S4：Power and Energy Systems I*	*S9：Computer Systems and Applications*
18:00-19:30	Banquet—1199 Huanhu West Third Road, Lingang New City, Nanhui New Town, Pudong New Area, Shanghai		

Day 2 (October. 8): Technical Sessions

Regular Sessions – Floor 5, School of Electronic Information Building			
	Room A	**Room B**	**Room C**
9:00-10:00	*S5：Image, Video, and Signal Processing*	*S6：Power and Energy Systems II*	*S10：Power and Energy Systems III*
10:00-10:10	Coffee Break		
10:10-11:40	*S7：Power and Energy Systems III*	*S8：Communications Systems and Networking & Control and Automation Systems*	*S10：Power and Energy Systems III*
11:40-12:30	Lunch—Room 201, School of Electronic Information Building		

◆ **Keynote Speakers**

Cesar Briso

Title: A Connected Sky: 6G Communications for UAVs

Cesar Briso is full professor and director of the Radiocommunications Group at the Technical University of Madrid, SPAIN. He has a 30 -year research trajectory, initially focused on the study and design of circuits and systems of high frequency and radar, and in the last 20 years he has focused on the design and development of wireless communications for transportation systems, especially focused on high speed trains, metropolitan railways and Unmanned aerial Vehicles. On 2010 he started working on wide band channel critical communications using 5G. On this topic he has done relevant research on the last years, making several scientific publications and collaborations with international experts of Europe, China and USA. He has managed 23 national and international research projects and hold two patents on critical communications for transportation systems. Now he is working on the project: "Next Generation Train Communications Systems", inside the Chinese program "The Belt and the Road". He is also author of 40 journal papers and has participated on more than 60 international congresses. He has been editor of 6 Special Issue and 2 books on wireless communications for transportation. He has received 4 National prizes for his research.

Peng Chen

Title: Efficient DOA Estimation Method for Reconfigurable Intelligent Surfaces Aided UAV Swarm

In recent years, Prof. Peng Chen has undertaken or participated in 12 national and provincial projects, published 30 SCI-indexed papers (2 ESI highly cited papers), and been granted 10 patents. He is currently an IEEE Senior Member and a CIE Senior Member. He serves as a guest editor for SCI journals, and as a reviewer for many international renowned journals including IEEE TSP, IEEE TWC, and IEEE TVT. He has also served as an IEEE ICCC Session Chair, was recognized as an exemplary reviewer for IEEE WCL in 2021, and won the Best Paper Award at IEEE ICCCCEE 2017. He was invited as a keynote speaker at the IEEE ICET International Academic Conference in 2022, won the Best Presentation Award at the IEEE ICCC Conference in 2022, and was selected as a Science and Technology Vice President of Jiangsu Province's High-level Talent Program in 2019. In 2021, he published the monograph "Optimization and Target Location Method of New Regime Radar", won the third prize of the Jiangsu Science and Technology Award (ranked 2nd), and obtained the Jiangsu Province Excellent Young Scientists Fund in 2022.

Jingchao Li

Title: Physical layer authentication method for the Internet of Things based on radio frequency signal gene characteristics

Jingchao Li is a professor at School of Electric Information, Shanghai Dianji University, China. In recent years, she has led over 14 technology projects, published over 30 SCI-indexed papers (1 ESI highly cited papers), and been granted over 6 patents. She is currently an EAI Senior Member. She serves as a reviewer for many international renowned journals including IEEE T RELIAB, RELIAB ENG SYST SAFE, and ENERG CONVERS MANAGE. She has also served as a Technical. Program Committee Member for INFOCOM MobiSec 2023 and an ICEICT 2019 Session Chair, and won the Best Paper Award at ICEICT 2019. She published two academic monographs. She has won the first prize of Energy Innovation Award of China Energy Research Society, and the third prize of the Shanghai Science and Technology Award. She has obtained the National Natural Science Foundation of China in 2017 and 2021, and Natural Science Foundation of Shanghai in 2022 and Shanghai Rising-Star Program in 2023. And obtained Shanghai Oriental Scholar in 2022.

◆ Sessions

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No.330799	**2D Map Generation Considering 3D Spatial Information of Objects for a Guide Dog Robot** Aoki Toya, Zhang Bin, Lim Hun-Ok (Kanagawa University)
No.333365	**Development of an Image Generation System for Expressing Auditory Environment to Hearing-impaired People** Aoki Toya, Zhang Bin, Lim Hun-Ok (Kanagawa University)
No.331667	**Robust Object Recognition and Command Understanding for a House Tidying-up Robot** Zhang Bin, Wang Junyan, Lim Hun-Ok (Kanagawa University)
No.332618	**3D Point Cloud Based Object Recognition and 3D Mapping** Ren Congzhi, Zhang Bin, Lim Hun-Ok (Kanagawa University)
No.333358	**Improved War Strategy Optimization Algorithm Based on Hybrid Strategy** Li Jiacheng, Noto Masato, Zhang Yang (Kanagawa University)
No.334807	**Intelligent Inspection System of Coal Preparation Plant Based on Dynamic QR Code** Wu Zhipeng, Xu Xuefei, Gao Yang, Liang Xin, Cai Cheng (Shanghai Dianji University)
No.334808	**On The Construction of Information Management System for Railroad Grouping Station Operation** Nie Yufei, Xu Xuefei, Cai Cheng (Shanghai Dianji University)
No.336205	**Research on short term power load forecasting based on Wavelet and BiLSTM** Liao Rongyang, Ren Juhui, Ji Chunlei (Shanghai Dianji University)

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S2	**14:00-15:40 (Sat. 7 October 2023)** Location: ROOM B, School of Electronic Information Building
	Title: Big data mining, D2D Communication, Security and Privacy for 6G Networks
	Chair: Chen Zhimin
No.334123	**Spectrum Allocation Algorithm based on Improved Chimp Optimization Algorithm** Huo Xingdong, Li Kuixian, Jiang Hang (Harbin Engineering University)
No.334504	**Research on Model Evaluation Technology Based on Modulated Signal Identification** Yang Songlin, Wang Mengchao, lin yun (Harbin Engineering University)
No.331740	**Parking space matching and path planning based on Wolf feeding decision algorithm in large underground garage** Dou Nan, Lian Zhigang, Guo Chunlei (Shanghai Dianji University)
No.331780	**Research on physical layer authentication method of internet of things based on contour stellar images and convolutional neural network** Lu Ying, Li Jingchao, Ying Yulong, Zhang Bin (Shanghai Dianji University)
No.334709	**Double IRS-Aided Dual-function Radar and Communication System** Chen Zijia, Yang Liu, Zhao Ying, Zhang Tiancheng (Shanghai Dianji University)
No.334711	**Channel Estimation for RIS Communication System with Deep Scaled Least Squares** Zhang Tiancheng, Yang Liu, Zhao Ying, Chen Zijia (Shanghai Dianji University)
No.336206	**Algorithmic protection study based on a Virtual Location** Wen Zehui, Zhu Yiqun (Shanghai Dianji University)

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S3	**16:00-17:30 (Sat. 7 October 2023)** Location: ROOM A, School of Electronic Information Building ***Title: Artificial intelligent techniques for 6G Networks*** Chair: Sui Tingting
No.331741	**Subway Double-door Anti-pinch Based On RGBD Binary Classification Network.** Guo Chunlei, Yang Junjie, Sui Zhicheng, Dou Nan (Shanghai Dianji University)
No.333139	**Design and Implementation of Intelligent IoT Paper Pumping System Based on Face Recognition of Loongson Processor** Hou Yichen, Wang Tingjun, Zhang Zhenyu, Chen Zheyi (Shanghai Dianji University)
No.333183	**Aluminum Defect Detection based on Weighted Feature Fusion Mechanism** Sui TingTing, Wang JunWen, Wang YuJie, Yang JunJie, Xu ZiHan, Zou YiWen, Zhong YiKai (Shanghai DianJi University)
No.333184	**MS_TextSpotter_An_Intelligent_Instance_Segmentation_Scheme_for_Semantic Scene Text Recognition in Asian Social Networks** Zhong Yikai, Zhang Heng, Liu Yanli, Qian Qiang, Wang Junwen (Shanghai Dianji University)
No.333337	**Improved solar photovoltaic panel defect detection technology based on YOLOv5** Teng Shangxian, Liu Zhonghua, Luo Yichen, Zhang Pengpeng (Shanghai Dianji University)
No.334793	**YOLO-L:A YOLO-BASED ALGORITHM FOR REMOTE SENSING IMAGE TARGET DETECTION** Wang Yinghe, Liu Wenjun, Wu Jiangbo (Shanghai Dianji University)

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S4	**16:00-17:30 (Sat. 7 October 2023)** Location: ROOM B, School of Electronic Information Building
	Title: Power and Energy Systems I
	Chair: Zhang Pengpeng
No.330179	**An effective N-BEATS network model for short term load forecasting** Tan Chang, Yu Xiang, Lu Lihua, Zhao Lisen (Shanghai Dianji University)
No.333349	**A Novel Ultra Short-Term Load Forecasting Algorithm of a Small Microgrid Based on Support Vector Regression** Liu Lin (Shanghai DianJi University)
No.335880	**Laser welding process of lithium battery lugs based on finite element simulation** Ren Tianpeng (Shanghai Dianji University)
No.335955	**Failure and Stress Analysis of Cylindrical Springs** Sun Mingze, Guo YanBin (Shanghai Dianji University)
No.335976	**Detection of Corrosion Areas in Power Equipment Based on Improved YOLOv5s Algorithm with CBAM Attention Mechanism** WenSun (Shanghai DianJi University)

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S5	**9:00-10:00 (Sun. 8 October 2023)** Location: ROOM A, School of Electronic Information Building ***Title: Image, Video, and Signal Processing*** Chair: Li Jiandun
No.330627	**Detection of Green Walnuts on Trees Using the Improved YOLOv7 Model** He Jinrong (Yan'an University)
No.331611	**Disease Recognition of Plants Leaves in Northern Shaanxi based on Siamese Networks** He Jinrong, Zhang Jiayi, Sun Yani, Yang Li (Yan'an University)
No.333086	**Application of MED-TET to feature extraction of vibration signals** Shan Ningfeng, Jiang Chao, Mao Xuefeng (Shanghai Dianji University)
No.333252	**A NOVEL PHASE CONGRUENCY-BASED IAMGE MATCHING METHOD FOR HETEROGENOUS IMAGES** Li Donghua (Shanghai Dianji University)
No.333253	**Design of Image Based Optical Flow Tracking and Positioning System in Intelligent Assembly** Wang Su (Shanghai Dianji University)
No.333334	**A Review of Image and Point Cloud Fusion in Autonomous Driving** Wang Xiaoya, Zhang Pengpeng, Dou Mengshen, Tian Shuhao (Shanghai Dianji University)
No.333335	**Deep learning in strawberry growth monitoring research: A review** Tian Shuhao, Zhang Pengpeng, Wang Xiaoya (Shanghai Dianji Univerisity)

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S6	**9:00-10:00 (Sun. 8 October 2023)** Location: ROOM B, School of Electronic Information Building
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No.329797	**Predicting time series energy consumption based on Transformer and LSTM** Wang Haitao, Li Jiandun, Liu Chang (Shanghai Dianji University)
No.329798	**Predicting Wind Turbine Power Output based on XGBoost** Liu Chang, Li Jiandun, Wang Haitao (Shanghai Dianji University)
No.333371	**Loop Closure Detection Based on Local and Global Descriptors with Sinkhorn Algorithm** Xiao Wei, Zhu Dong (Shanghai Dianji University)
No.335927	**Stainless steel crack detection based on MATLAB** Liao Wei, Wang Yongheng, Guo Yanbin (Electric Power Research Institute)

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S7	**10:00-11:40 (Sun. 8 October 2023)** Location: ROOM A, School of Electronic Information Building ***Title: Image, Video, and Signal Processing & Software Engineering*** Chair: Sui Tingting
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No.331613	**Performance Analysis of Web Server side Reactive Programming** Guo Xu, Li Haojie (Shanghai Dianji University)
No.332917	**Improved Sparrow Search Algorithm Optimized Neural Network Analysis Of Traffic Congestion** Lu Banban, Lian Zhigang (Shanghai Dianji University)
No.332918	**Industrial Noisy Speech Enhancement Using Joint Time-Frequency Loss Function Based on U-Net** Qin Rongxin, Lian Zhigang (Shanghai Dianji University)
No.333336	**Multiple Color Feature and Contextual Attention Mechanism based on YOLOX** Shan Shuaidi, Zhang Pengpeng, Wang Xinlei, Teng Shangxian, Luo Yichen (Shanghai Dianji University)
No.333351	**Quantitative Analysis on Coin Flipping Protocol** Guo Xu (Shanghai Dianji University)

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S8	**10:00-11:40 (Sun. 8 October 2023)** Location: ROOM B, School of Electronic Information Building
	Title: Communications Systems and Networking & Control and Automation Systems
	Chair: Zhang Pengpeng
No.331614	**Research on Cost Optimization of UAV Network Routing Protocol Based on OLSR Protocol** Xu Zhenyu, Li Xinlu, Xu Dawu (Huizhou Engineering Vocational College)
No.332169	**A Lightweight Fault Diagnosis Model of Rolling Bearing Based on Gramian Angular Field and EfficientNet-B0** Dai Yingyu, Li Jingchao, Ying Yulong, Zhang Bin (Shanghai Dianji University)
No.333077	**ISAC Device-free Sensing Method for V2V System** Yu Feiqiao, Chen Zhimin, Li Minzheng (Shanghai Dianji University)
No.334067	**Fuzzy sliding mode trajectory tracking control for omnidirectional mobile robots based on exponential convergence law** Ding Ruiao, Ji Chunlei, Zeng Xiangxu (Shanghai Dianji University)
No.334068	**Image Classification Method Base on Contrastive Learning** Cao Junye, Chi Dongxiang, Han Jingxuan (Shanghai Dianji University)
No.334796	**Research on RFID Indoor Localization Algorithm Based on Virtual Tags and Fusion of LANDMARC and Kalman Filter** Wu Jiangbo, Liu Hong, Liu Wenjun (Shanghai Dianji University)

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S9	**14:00-15:40, 16:00-17:30 (Sat. 7 October 2023)** Location: ROOM C, School of Electronic Information Building ***Title: Computer Systems and Applications***
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No.337448	**Research on Smart Library System Based on Big Data** Liu Ping (Harbin University of Science and Technology Libarary)
No.333317	**Smoke segmentation method based on super pixel segmentation and convolutional neural network** Wang Chengkun, Zhang Jinqiu, Yang Jiale, Feng Kaiyue (Heilongjiang University of Science and Technology)
No.334646	**Research on Distributed Routing Technology for LEO Satellite Network** Yin Zhongyu, Zhang Cheng, Wang Xi, Shi Shuo (Harbin Institute of Technology)
No.334801	**Analysis of Weld Pool Characteristics in Narrow Gap GTAW Welding Based on Passive Vision** Li Zehao (Shanghai Dianji University)

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S10	**9:00-10:00, 10:10-11:40 (Sun. 8 October 2023)** Location: ROOM C, School of Electronic Information Building ***Title: Power and Energy Systems III***
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No.334751	**Fault Diagnosis Method of Gas Turbine Combustion Chamber Based on CNN-GRU Model Analysis** Wang Xinyou, Ying Yulong (Shanghai University of Electric Power)
No.334755	**Research on Key Intelligent System in Unmanned Surface Vessel** Li Yongguo, Li Xiangyan, Xu Caiyin, Tang Xuan (Shanghai Ocean University)
No.334832	**Simulation research on thermal management of hydrogen fuel cell for UAV** Fan Yi, Chang Zixuan, Jiang Weiting, Zhang Jiakai, Zhang Jingkui (Shanghai University of Electric Power)
No.334833	**Performance analysis on a coupled system of gas turbine and air cycle driven by waste heat of flue gas** Fan Yi, Zhang Jingkui, Zhang Jiakai, Qiu Zhongzhu, Zheng Puyan, Yan Wen (Shanghai University of Electric Power)

◆ Organization

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