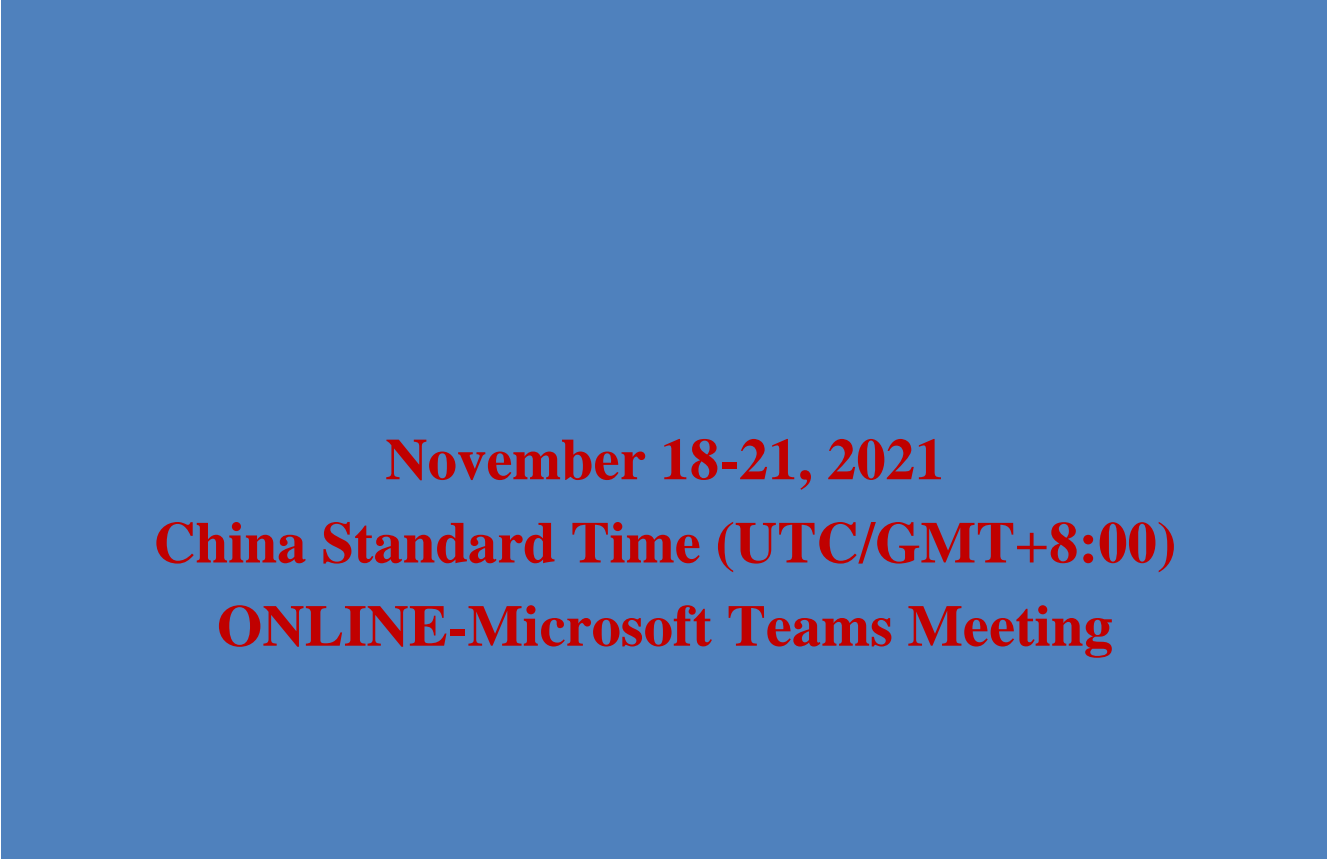




CECNET2021 CONFERENCE PROGRAM



November 18-21, 2021
China Standard Time (UTC/GMT+8:00)
ONLINE-Microsoft Teams Meeting

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Part I Conference Schedule

Thursday, November 18, 2021

MS Teams: <http://www.academicconf.com/teamslink?confname=cecnet2021>

09:00-11:00 MS Teams Online Conference Testing and Ice Breaking

15:00-17:00 MS Teams Online Conference Testing and Ice Breaking Continued

Friday Morning, November 19, 2021

MS Teams: <http://www.academicconf.com/teamslink?confname=cecnet2021>

The morning's session will be chaired by Yongli Zhao (First Half), Professor, Beijing University of Posts and Telecommunications, China and Yafeng Liu (Second Half), Academy of Mathematics and Systems Science, Chinese Academy of Sciences, China

WELCOME SPEECH

09:00-09:10 *Kun Xu, Professor, Vice President of the Beijing University of Posts and Telecommunications, China;*

Shanguo Huang, General Chair of CECNet2021, Professor, Dean of School of Science, Beijing University of Posts and Telecommunications, China

09:10-09:50 **Keynote Speech 1: Recent Advances in Nonlinear Optimization**

Prof. Yuhong Dai, Academy of Mathematics and Systems Science, Chinese Academy of Sciences, China

09:50-10:30 **Keynote Speech 2: Joint Communication and Sensing System Toward 6G Intelligent Machine-type Communication**

Prof. Zhiyong Feng, Beijing University of Posts and Telecommunications, China

10:30-10:40 BREAK

10:40-11:20 **Keynote Speech 3: Applying Mobile Crowd Sensing for Data Collection in Smart Agriculture**

Prof. Lei Shu, College of Engineering, Nanjing Agricultural University, China

11:20-12:00 **Keynote Speech 4: Intelligent Communication and Network Resource Optimization at the Network Edge**

Prof. Zhaolong Ning, Chongqing University of Posts and Telecommunications, China

12:00-13:30 BREAK

Friday Afternoon, November 19, 2021

13:30-16:50 **Oral Session 1: Electronics Technology and VLSI I**

MS Teams link: <http://www.academicconf.com/teamslink?confname=cecnet2021>

13:30-16:50 **Oral Session 2: Systems Science and Information Communication I**
MS Teams link:
<http://www.academicconf.com/teamslink?confName=cecnet2021&sessionid=2>

Friday Afternoon, November 19, 2021

MS Teams: <http://www.academicconf.com/teamslink?confname=cecnet2021>

Session Chair: Prof. Cong Sun, Beijing University of Posts and Telecommunications, China

17:00-17:40 **Keynote Speech 5: Transceiver and Resource Optimization in Wireless Communications: From 3G to 6G**
Prof. Eduard Axel Jorswieck, Technische Universitaet Braunschweig, Germany

Saturday, November 20, 2021

09:00-12:05 **Oral Session 3: Electronics Technology and VLSI II**
MS Teams link: <http://www.academicconf.com/teamslink?confname=cecnet2021>

09:00-12:00 **Oral Session 4: Systems Science and Information Communication II**
MS Teams link:
<http://www.academicconf.com/teamslink?confName=cecnet2021&sessionid=2>

12:05-14:00 BREAK

14:00-18:10 **Oral Session 5: Information Functional Materials and Devices**
MS Teams link: <http://www.academicconf.com/teamslink?confname=cecnet2021>

14:00-18:25 **Oral Session 6: Communication Networks and Network Security I**
MS Teams link:
<http://www.academicconf.com/teamslink?confName=cecnet2021&sessionid=2>

Sunday, November 21, 2021

MS Teams: <http://www.academicconf.com/teamslink?confname=cecnet2021>

09:00-12:05 **Oral Session 7: Communication Networks and Network Security II**

12:05-14:00 BREAK

14:00-16:00 **Oral Session 8: Communication Networks and Network Security III**

16:00-17:00 **Closing Speech & Poster Session**

Part II Keynote Speeches

Keynote Speech 1: Recent Advances in Nonlinear Optimization

Speaker: Prof. Yuhong Dai

Academy of Mathematics and Systems Science, Chinese Academy of Sciences, China.

Bio: Yu-Hong Dai is a Full Professor in the Academy of Mathematics and Systems Science (AMSS), Chinese Academy of Sciences. He received the B.Sc. degree in applied mathematics from the Beijing Institute of Technology in 1992, and received the Ph.D. degree in nonlinear programming from the Institute of Computational Mathematics and Scientific/Engineering Computing, Chinese Academy of Sciences in 1997. He is now the president of Operations Research Society of China (ORSC) and the chief editor of *Operations Research Transactions (in Chinese)*. He is also the director of the Center for Optimization and Applications (COA) of AMSS. His research interests include continuous optimization, integer programming and various optimization applications. He received Shiing-Shen Chern Mathematics Award, Feng Kang Scientific Computing Award, Xiao Shutie Applied Mathematics Award, Second Prize of the National Natural Science of China (Rank 2), and the Tenth Science and Technology Award for Chinese Youth. He also won the China National Funds for Distinguished Young Scientists and a Best Paper Award on the 2011 International Conference on Communications.



Abstract of the speech: Nonlinear optimization stems from calculus and becomes an independent subject due to the proposition of Karush-Kuhn-Tucker optimality conditions. The ever-growing realm of industrial applications and the vast demand from AI development are driving nonlinear optimization research in new and exciting directions. In this talk, I shall address some recent advances on nonlinear optimization, mainly on unconstrained optimization, constrained optimization, optimization with least constraint violation and minimax optimization.

Keynote Speech 2: Joint Communication and Sensing System Toward 6G Intelligent Machine-type Communication

Speaker: Prof. Zhiyong Feng
Beijing University of Posts and Telecommunications, China

Bio: Zhiyong Feng (Senior Member, IEEE) received the B.S., M.S. and Ph.D. degrees from Beijing University of Posts and Telecommunications (BUPT), China. Now she is a professor at BUPT and the Director of Key Laboratory of Universal Wireless Communications, Ministry of Education, China. She received Outstanding Young Researcher Award from Natural Science Foundation of China (NSFC) in 2015, and she has been Millions of Talent Projects National candidates. Currently, she is serving as Associate Editors-in-Chief for China Communications, and a technological advisor for NGMN. She is a member of Expert Committee of China Intelligent Transportation Systems Association, chair of the Information and Communication Test Committee of the Chinese Institute of Communications. Her main research interests include the cognitive wireless network, wireless network virtualization for 5G, and joint wireless communication and radar sensing system. Her main research interests include wireless network architecture design and radio resource management in mobile networks, spectrum sensing and dynamic spectrum management in cognitive wireless networks, and integrated sensing and communications.



Abstract of the speech: With the rapid development of telemedicine, high level autonomous driving, intelligent manufacturing, etc., the research on intelligent machine-type communication (IMTC) is imminent. The traditional mobile network technology has been difficult to meet the requirements. To support this, the deep integration of sensing, communication and computing in future mobile communication networks should be studied. This speech will introduce the concept of Joint Communication and Sensing System for IMTC networks, and discuss key challenges and candidate technologies for future research.

Keynote Speech 3: Applying Mobile Crowd Sensing for Data Collection in Smart Agriculture

Speaker: Prof. Lei Shu
College of Engineering, Nanjing Agricultural University, China

Bio: Lei Shu (Senior Member, IEEE) received the B.S. degree in computer science from South Central University for Nationalities, China, in 2002, the M.S. degree in computer engineering from Kyung Hee University, South Korea, in 2005, and the Ph.D. degree from the Digital Enterprise Research Institute, National University of Ireland, Galway, Ireland, in 2010. Until 2012, he was a Specially Assigned Researcher with the Department of Multimedia Engineering, Graduate School of Information Science and Technology, Osaka University, Japan. He is currently a Distinguished Professor with Nanjing Agricultural University, China, and a Lincoln Professor with the University of Lincoln, U.K. He is also the Director of the NAU-Lincoln Joint Research Center of Intelligent Engineering. He has published more than 400 articles in related conferences, journals, and books in the areas of sensor networks and Internet of Things. His current H-index is 60 and i10-index is 197 in Google Scholar Citation. His current research interests include wireless sensor networks and the Internet of Things. He has also served as a TPC member for more than 150 conferences, such as ICDCS, DCOSS, MASS, ICC, GLOBECOM, ICCCN, WCNC, and ISCC. He was a recipient of the 2014 Top Level Talents in Sailing Plan of Guangdong Province, China, the 2015 Outstanding Young Professor of Guangdong Province, and the GLOBECOM 2010, ICC 2013, ComManTel 2014, WICON 2016, SigTelCom 2017 Best Paper Awards, the 2017 and 2018 IEEE Systems Journal Best Paper Awards, the 2017 Journal of Network and Computer Applications Best Research Paper Award, and the Outstanding Associate Editor Award of 2017, and the 2018 IEEE Access. He has also served more than 50 various Co-Chair for international conferences/workshops, such as IWCMC, ICC, ISCC, ICNC, Chinacom, especially the Symposium Co-Chair for IWCMC 2012, ICC 2012, the General Co-Chair for Chinacom 2014, Qshine 2015, Collaboratecom 2017, DependSys 2018, and SCI 2019, the TPC Chair for InisCom 2015, NCCA 2015, WICON 2016, NCCA 2016, Chinacom 2017, InisCom 2017, WMNC 2017, and NCCA 2018.



Abstract of the speech: Smart agriculture enables the efficiency and intelligence of production in physical farm management. Though promising, due to the limitation of the existing data collection methods, it still encounters few challenges required to be considered. Mobile Crowd Sensing (MCS) is a technique where many individuals having mobile devices, e.g., smartphones and wearable equipment, are capable of sensing and sharing information of interest, aiming to complete large-scale and complex sensing tasks with three beneficial characteristics: 1) cost-effectiveness; 2) scalability; and 3) mobility. With the Internet of Things becoming a reality, smartphones are widely becoming available even in remote areas. Hence, both the MCS characteristics and the plug-and-play widely available infrastructure provide enormous opportunities for MCS-enabled smart agriculture, opening several new opportunities at the application level. This report extensively evaluates Agricultural Mobile Crowd Sensing (AMCS) and provides insights for agricultural data collection schemes. In addition, we offer a comparative study with the existing agriculture data collection solutions and conclude that AMCS has significant benefits in terms of flexibility, collecting implicit

data, and low-cost requirements. To this end, we perform a detailed analysis of the challenges and opportunities that concerns MCS-enabled agriculture by putting forward seven potential applications of AMCS-enabled agriculture.

Keynote Speech 4: Intelligent Communication and Network Resource Optimization at the Network Edge

Speaker: Prof. Zhaolong Ning
Chongqing University of Posts and Telecommunications, China

Bio: Zhaolong Ning received the PhD degree from Northeastern University, China in 2014. He was a research assistant with Kyushu University from 2013 to 2014, Japan, and a Hong Kong Scholar with The University of Hong Kong from 2019 to 2021. Currently, he is a full professor at the Chongqing University of Posts and Telecommunications, China. His research interests include Internet of things, mobile edge computing, and network optimization. He has published more than 120 scientific papers in international journals and conferences, such as IEEE JSAC, IEEE TMC, IEEE TPDS, IEEE T-ITS, IEEE COMST, IEEE COMMAG, IEEE Wireless Communications, and so on. He is the recipient of several prestigious awards including the Best Land Transportation Paper Award of IEEE TVT 2020, Best Paper Award of IEEE Systems Journal 2019 and so on.



He serves as an associate editor or guest editor of several journals, such as the IEEE TII and IEEE TCSS. He has also chaired more than 20 international conferences, such as IEEE GLOBECOM and IEEE Healthcom. He is a Highly Cited Researcher (Web of Science), Highly Cited Chinese Researchers (Elsevier), and elected to be the Young Elite Scientists Sponsorship Program by China Association for Science and Technology.

Abstract of the speech: Pervasive Edge Computing (PEC) refers to one kind of edge computing that merely relies on edge devices with sensing, storage and communication abilities to realize peer-to-peer offloading without centralized management. However, on one hand, users may not make appropriate scheduling decisions based on their local observations. On the other hand, how to guarantee the fairness among different edge devices in the fully decentralized environment is rather challenging. In this talk, we first present a multi-agent Imitation learning model in PEC networks, to adapt to the high mobility of users and resolve the shortcomings of the limited storage capacity of edge servers. Then, we propose a remote health monitoring model for Internet of medical things, as an example for delay-sensitive service applications. Highlighting its characteristics, the cost of patients depends on medical criticality, age of information and energy consumption. After that, we propose an imitation learning enabled online task scheduling algorithm with near-optimal performance for Internet of vehicles, as an example for high-concurrency service applications. Specially, an expert can obtain the optimal scheduling policy by solving the formulated optimization problem with a few samples offline.

Keynote Speech 5: Transceiver and Resource Optimization in Wireless Communications: From 3G to 6G

Speaker: Prof. Eduard Axel Jorswieck
Technische Universitaet Braunschweig, Germany

Bio: Eduard Axel Jorswieck is the managing director of the Institute of Communications Technology, the head of the Chair for Communications Systems and Full Professor at Technische Universitaet Braunschweig, Germany. He received the Dipl.-Ing. degree in Computer Engineering and the PhD degree in Electrical Engineering both from TU Berlin in 2000 and 2004, respectively. His main research interests are in the broad area of communications, signal processing, and applied information theory. He is IEEE fellow, and Editor-in-Chief of the EURASIP Journal on Wireless Communications and Networking. He has won several awards, including IEEE Signal Processing Society Best Paper and other conference best papers and best student papers.



Abstract of the speech: The efficient design of transmitter and receiver operations as well as efficient usage of resources in wireless communications is based on optimisation models and algorithms. In fact, every new generation of mobile communications requires a close-to-optimal solution of certain programming problems in order to select the suitable technologies and their best configurations. In the early wireless systems, resource allocation could be performed based on linear and convex programming since orthogonal multiple access schemes and homogeneous objectives were applied. With multi-carrier and multiple antenna technologies and throughput maximisation, the triumph of convex optimisation began. When other performance metrics, such as energy efficiency, became relevant, quasi- and pseudo-convex, fractional programming methods were successfully applied. Popular non-orthogonal access methods and the goal of higher resource efficiency led to more general non-convex and general global programming problems. Therefore, global programming approaches such as mixed monotonic programming with branch-and-bound methods are recently developed. Currently, heterogeneous wireless system designs are envisioned for 6G wireless, with flexible open radio network architectures. Here we leave classical optimisation methods and proceed towards machine learning approaches. The keynote will lead through these developments and illustrate two recent system designs for 6G wireless networks, one based on global programming and one based on machine learning.

Part III Oral Presentations

Oral Presentation Guidelines

- ✚ Online Oral Presentations will be held on [Microsoft Teams Meeting](#).
- ✚ All presenters are requested to reach the Online Session Room prior to the schedule time and complete their presentation on time.
- ✚ All presentations are scheduled in **China Standard Time (UTC/GMT+8)**.
- ✚ If a presenter is not able to show up via Teams, the session chair / conference secretary will download and play the pre-recorded video presentation during his/her scheduled presentation time, if listeners have questions about the presentation, please contact the conference secretary to forward the questions.
- ✚ Signed and stamped electronic presentation certificate would be issued via e-mail after conference.

Best Oral Presentations Selection

Selection Criteria:

The session chair will select one best oral presentation from his/her session based on the following criteria:

- ✓ Research Quality
- ✓ Presentation Performance
- ✓ Presentation Language
- ✓ PowerPoint Design

Best Oral Presentations Award

The Best Presenter will receive an official certificate and a free registration to the CECNet2022.

Session 1: Electronics Technology and VLSI I

Online room link: <http://www.academicconf.com/teamslink?confname=cecnet2021>

Session Chair:

Prof. Xu Zhang, Chongqing University of Posts and Telecommunications, China

Time: 13:30-16:50, Friday, November 19, 2021

13:30-13:55	CNT2954 (Invited)	Stabilizing Frame Slotted Aloha Based IoT Systems: A Geometric Ergodicity Perspective <i>Prof. Jihong Yu, Beijing Institute of Technology, China</i>
13:55-14:20	CNT2955 (Invited)	Mobility Management: From Terrestrial to Non-Terrestrial Networks <i>Prof. Chengchao Liang, Chongqing University of Posts and Telecommunications, China</i>
14:20-14:45	CNT2875 (Invited)	Chemical Sensors Based on Water-Gated Organic Thin-Film Transistors <i>Prof. Tsuyoshi Minami, The University of Tokyo, Japan</i>
14:45-15:10	CNT2880 (Invited)	Modelling and Performance Evaluation of Packet Aggregation Mechanisms <i>Prof. Tadeusz Czachorski, Institute of Theoretical and Applied Informatics, Polish Academy of Sciences, Poland</i>
15:10-15:20	Coffee Break	
15:20-15:45	CNT2790 (Invited)	Pixel-Based Visual Feedback Controller for an Articulated Robot on a Sliding Rail <i>Prof. Fusaomi Nagata, Sanyo-Onoda City University, Japan</i>
15:45-16:10	CNT2776 (Invited)	Parametric Optimization of Integrated Circuit Assembly Process: An Evolutionary Computing-Based Approach <i>Prof. Tatjana Sibalija, Belgrade Metropolitan University, Serbia</i>
16:10-16:35	CNT2783 (Invited)	On Characterization of Dielectric Properties of Non-standard Materials Using a Low-cost Resonator Circuit <i>Prof. Miroslav Joler, University of Rijeka, Croatia</i>
16:35-16:50	CNT2896	Efficiency Measurement of Compressed Air Compressors Using High Availability SoC With 1002 Redundancy Architecture <i>Dr. Mohamed Abdelawwad, Institute for Computer Architecture and System Programming (ICAS), University of Kassel, Germany</i>

Session 2: Systems Science and Information Communication I

Online room link: <http://www.academicconf.com/teamslink?confname=cecnet2021&sessionid=2>

Session Chair:

Prof. Chao Shen, Beijing Jiaotong University, China

Prof. Yafeng Liu, Academy of Mathematics and Systems Science, Chinese Academy of Sciences, China

Time: 13:30-16:50, Friday, November 19, 2021

13:30-13:55	CNT2956 (Invited)	Towards Efficient Massive MIMO Detection: Antenna Efficiency and Algorithm <i>Prof. Yafeng Liu, Academy of Mathematics and Systems Science, Chinese Academy of Sciences, China</i>
13:55-14:20	CNT2957 (Invited)	Integrated Sensing and Communications for 6G and Beyond <i>Dr. Fan Liu, Southern University of Science and Technology, China</i>
14:20-14:45	CNT2958 (Invited)	An Efficient Quadratic Programming Relaxation Based Algorithm for Large-Scale MIMO Detection <i>Dr. Qingna Li, School of Mathematics and Statistics, Beijing Institute of Technology, China</i>
14:45-15:10	CNT2959 (Invited)	Understanding Multidimensional Data Under the Lens of Bayesian Tensor Methods <i>Dr. Lei Cheng, Zhejianng University, China</i>
15:10-15:20	Coffee Break	
15:20-15:45	CNT2960 (Invited)	A Novel Signal Waveform for Future Communications – OTFS <i>Dr. Weijie Yuan, Southern University of Science and Technology, China</i>
15:45-16:10	CNT2964 (Invited)	Optimal Network Slicing for Service-Oriented Networks with Flexible Routing and Guaranteed E2E Latency <i>Dr. Weikun Chen, Beijing Institute of Technology, China</i>
16:10-16:35	CNT2800 (Invited)	Phase Tracking Sequences for 5G NR in 52.6-71 GHz Band: Design and Analysis <i>Prof. Maltsev Alexander, Nizhny Novgorod State University, Russia</i>
16:35-16:50	CNT2804	Optical Vortices Sharp Focusing by Silicon Ring Gratings Using High-performance Computer Systems <i>Dr. Dmitry Savelyev, Samara National Research University, Russia</i>

Session 3: Electronics Technology and VLSI II

Online room link: <http://www.academicconf.com/teamslink?confname=cecnet2021>

Session Chair:

Prof. Pengxing Guo, Chongqing University of Posts and Telecommunications, China

Time: 09:00-12:05, Saturday, November 20, 2021

09:00-09:25	CNT2769 (Invited)	Stable, Wavelength-Tunable and Amplitude-Equalized Rational Harmonic Mode-Locked Laser Employing a Short Bismuth-Oxide-Based Highly Nonlinear Erbium-Doped Fiber <i>Assoc. Prof. Yutaka Fukuchi, Tokyo University of Science, Japan</i>
09:25-09:50	CNT2947 (Invited)	Managing MyGRANTS Fragmented Database Using Binary Vote Assignment Grid Quorum with Association Rule (BVAGQ-AR) Replication Model <i>Assoc. Prof. Noraziah Ahmad, Universiti Malaysia Pahang, Malaysia</i>
09:50-10:15	CNT2873 (Invited)	Visual Edge Computing and Dependable Learning <i>Prof. Baochang Zhang, Beihang University, China</i>
10:15-10:30	CNT2825	Novel Constraints Reduction based Relays Coordination and Hybrid Sensing of Faults for the Active Distribution Systems with Variable Operating Modes <i>Dr. Ekta Purwar, Indian Institute of Technology (IIT-BHU) Varanasi, India</i>
10:30-10:45	Coffee Break	
10:45-11:00	CNT2866	RISC-V Based Safety System-on-Chip with Hardware Comparator <i>Mr. Eike Hahn, Institute for Computer Architecture and System Programming, University of Kassel, Germany</i>
11:00-11:25	CNT2850 (Invited)	Role of Artificial Intelligence and Machine Learning in Diagnostic Procedure for Efficient Health Care System <i>Prof. Mahua Bhattacharya, Atal Bihari Vajpayee Indian Institute of Information Technology and Management, India</i>
11:25-11:50	CNT2899 (Invited)	An Approach for Infrared Image Pedestrian Classification Based on Local Directional Pixel Structure Elements' Descriptor <i>Assoc. Prof. Rajkumar Soundrapandiyan, Vellore Institute of Technology, India</i>
11:50-12:05	CNT2949	IR Laser Explosives Detection System <i>Mr. Alexander V. Makeev, Siberian State University of Geosystems and Technologies, Russia</i>

Session 4: Systems Science and Information Communication II

Online room link: <http://www.academicconf.com/teamslink?confname=cecnet2021&sessionid=2>

Session Chair:

Prof. Shu Cai, Nanjing University of Posts and Telecommunications, China

Prof. Cong Sun, Beijing University of Posts and Telecommunications, China

Time: 09:00-12:00, Saturday, November 20, 2021

09:00-09:25	CNT2962 (Invited)	Old and New: Challenges towards 6G Wireless Communications <i>Dr. Chao Shen, Beijing Jiaotong University, China</i>
09:25-09:50	CNT2963 (Invited)	Stochastic Mirror Descent for Low-Rank Tensor Decomposition Under Non-Euclidean Losses <i>Dr. Wenqiang Pu, Shenzhen Research Institute of Big Data, China</i>
09:50-10:15	CNT2961 (Invited)	Sum Rate Maximization for Reconfigurable Intelligent Surface Aided Two-User Downlink Channel <i>Prof. Cong Sun, Beijing University of Posts and Telecommunications, China</i>
10:15-10:30	Coffee Break	
10:30-10:55	CNT2966 (Invited)	A RIS-Assisted Dual-functional Radar-Communication System <i>Prof. Shu Cai, Nanjing University of Posts and Telecommunications, China</i>
10:55-11:20	CNT2967 (Invited)	Symbol-Level Precoding: Exploiting Wireless Interference in 6G and Beyond <i>Dr. Ang Li, Xi'an Jiaotong University, China</i>
11:20-11:45	CNT2965 (Invited)	Towards Designing Optimal Sensing Matrices for Non-linear Inverse Problems <i>Dr. Junjie Ma, Academy of Mathematics and Systems Science, Chinese Academy of Sciences, China</i>
11:45-12:00	CNT2854	Searching and Rescuing Victims in Emergency: A Comprehensive Survey <i>Mr. Huibo Bi, Beijing University of Technology, China</i>

Session 5: Information Functional Materials and Devices

Online room link: <http://www.academicconf.com/teamslink?confname=cecnet2021>

Session Chairs:

Prof. Ming Lei, Beijing University of Posts and Telecommunications, China

Prof. Limin Guo, Beijing University of Posts and Telecommunications, China

Time: 14:00-18:10, Saturday, November 20, 2021

14:00-14:25	CNT2968 (Invited)	Ultrafast THz Dynamics of Novel Topological Polar Structures <i>Dr. Qian Li, Tsinghua University, China</i>
14:25-14:50	CNT2969 (Invited)	Modulation Effects of Dielectric Metamaterials on Electromagnetic Wave Propagation <i>Dr. Guoyan Dong, University of Chinese Academy of Sciences, China</i>
14:50-15:15	CNT2970 (Invited)	Polarization-Sensitive Photodetectors Based on 2D Layered Semiconductors <i>Dr. Zhongming Wei, Institute of Semiconductors, Chinese Academy of Sciences, China</i>
15:15-15:40	CNT2971 (Invited)	New Progress of Mechanical Exfoliation and Its Applications in 2D Materials <i>Dr. Yuan Huang, Beijing Institute of Technology, China</i>
15:40-16:05	CNT2806 (Invited)	Research on Key Technologies of Collaborative Direct Position Determination of Sea-aero Targets Based on Distributed Arrays <i>Prof. Ding Wang, PLA Strategic Support Force Information Engineering University, China</i>
16:05-16:20	Coffee Break	
16:20-16:45	CNT2773 (Invited)	An Optimized Byzantine Fault Tolerance Algorithm for Consortium Blockchain <i>Assoc. Prof. Zhihan Lv, Qingdao University, China</i>
16:45-17:00	CNT2801	Investigating Automated Hyper-Parameter Optimization for a Generalized Path Loss Model <i>Dr. Usman Sammani SANI, Universiti Brunei Darussalam, Negara Brunei Darussalam</i>
17:00-17:15	CNT2812	Research on Improved Ant Colony Optimization Based on Adaptive Chemical Reaction Optimization <i>Dr. Teng Fei, Institute of Information Engineering, Tianjin University of Commerce, China</i>
17:15-17:30	CNT2839	Improved Artificial Bee Colony Algorithm Based on Harris Hawks Optimization <i>Dr. Zuo Chen Ren, Tianjin University of Commerce, China</i>
17:30-17:45	CNT2778	Smart Manufacturing and Jobs <i>Mr. Juvenal Mendoza-Valencia, Instituto Politécnico Nacional, México</i>
17:45-18:10	CNT2847 (Invited)	Analysis of the Characteristics of Space-time Trellis Code Generator Matrix Generated from Lisy Tree Structure <i>Assoc. Prof. Harlisya Harun, Satellite Communication and Avionics System Integration, Research Lab, Universiti Kuala Lumpur, Malaysia</i>

Session 6: Communication Networks and Network Security I

Online room link: <http://www.academicconf.com/teamslink?confname=cecnet2021&sessionid=2>

Session Chair:

Prof. Bingli Guo, Beijing University of Posts and Telecommunications, China

Time: 14:00-18:25, Saturday, November 20, 2021

14:00-14:25	CNT2975 (Invited)	Communication-efficient Decentralized Machine Learning over Heterogeneous Networks <i>Dr. Hongfang Yu, University of Electronic Science and Technology of China, China</i>
14:25-14:50	CNT2973 (Invited)	The History of Packet Switching Networks and Evolution of Optical Switching Data Center Networks <i>Dr. Fulong Yan, Alibaba Cloud, Alibaba Group, China</i>
14:50-15:15	CNT2974 (Invited)	Shaped Modulation and Hybrid FEC for Optical Fiber Communication <i>Dr. Bin Chen, Hefei University of Technology, China</i>
15:15-15:40	CNT2972 (Invited)	High-fidelity Low-latency 5G Fronthaul Network Enabled by ADX-RoF <i>Dr. Paikun Zhu, National Institute of Information and Communications Technology, Japan</i>
15:40-16:05	CNT2976 (Invited)	All-optical Encryption Technology for Secure Optical Transmission <i>Dr. Xiaoxue Gong, Chongqing University of Posts and Telecommunications, China</i>
16:05-16:20	Coffee Break	
16:20-16:45	CNT2862 (Invited)	Role of Massive MIMO and Next Generation Network <i>Assoc. Prof. Amrita Ruperee, University of Mumbai, India</i>
16:45-17:10	CNT2879 (Invited)	Multi-RAT Orchestration Method for Heterogeneous Wireless Networks <i>Prof. Sudan Jha, Christ (Deemed to be University) Delhi, India</i>
17:10-17:35	CNT2977 (Invited)	Dynamic Entanglement-based Quantum Communication Networks <i>Dr. Rui Wang, University of Bristol, UK</i>
17:35-18:00	CNT2830 (Invited)	An Approach of IoT Enabled by TCNet: Trellis Code Network– A New Algorithm and Routing Protocol <i>Prof. Diogo F. Lima Filho, Paulista University-UNIP, São Paulo, Brazil</i>
18:00-18:25	CNT2855 (Invited)	Advanced Architectures of Next Generation Wireless Networks <i>Prof. Pascal Lorenz, University of Haute-Alsace, France</i>

Session 7: Communication Networks and Network Security II

Online room link: <http://www.academicconf.com/teamslink?confname=cecnet2021>

Session Chair:

Prof. Xuwei Xue, Beijing University of Posts and Telecommunications, China

Time: 09:00-12:05, Sunday, November 21, 2021

09:00-09:15	CNT2803	Calculation of RMS Values for Variable Frequency Sinusoidal Signals, Using Phasors and Digital SAL and CAL Filters <i>Dr. Flabio Gutierrez, Universidad Nacional de Piura, Peru</i>
09:15-09:40	CNT2808 (Invited)	The Democratic Appeal of Blockchain for the Internet of Everything <i>Prof. Henry Hexmoor, Southern Illinois University, USA</i>
09:40-09:55	CNT2871	Synchronous and Asynchronous Phase Demodulation in Optical Metrology Using the Frequency Transfer Function (FTF) Formalism: A Review <i>Dr. Moises Padilla, Centro de Investigaciones en Optica, A.C., Mexico</i>
09:55-10:10	CNT2846	Use Noise Protocol Framework to Build Secure Communication Channel for IoT Scenarios <i>Ms. Pan Lanlan, Guangdong OPPO Mobile Telecommunications Corp. Ltd., China</i>
10:10-10:25	CNT2897	A New Identity-Based Encryption Scheme with Accountable Authority based on SM9 <i>Dr. Song Luo, Chongqing University of Technology, China</i>
10:25-10:40	Coffee Break	
10:40-10:55	CNT2867	Classification of Knee Osteoarthritis Severity Using Modified Masks to Preprocess X-ray Images in a Deep Learning Model <i>Dr. Ching-Chung Yang, Tatung Institute of Technology</i>
10:55-11:10	CNT2909	IoT Applications and Case Study <i>Dr. Viswanatha V, Acharya Institute of Technology, India</i>
11:10-11:25	CNT2935	Term Clarification and Causes of Unspecified Requirements in IT Enterprises <i>Dr. Serda Hauser, University Leipzig, Germany</i>
11:25-11:40	CNT2853	COVID-19 IInd Wave Telepsychiatry: Efficacy of Neuro-Firefly Keys (NFKs) with Secured Functional Encryption Through New Lossless Secret Sharing <i>Dr. Joydeep Dey, M.U.C. Women's College, Burdwan, India</i>

11:40-12:05	CNT2923 (Invited)	Challenges for Trust in IoT and AI <i>Prof. Gyu Myoung Lee, Liverpool John Moores University, UK</i>
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Session 8: Communication Networks and Network Security III

Online room link: <http://www.academicconf.com/teamslink?confname=cecnet2021>

Session Chair:

Prof. Bingli Guo, Beijing University of Posts and Telecommunications, China

Time: 14:00-16:00, Sunday, November 21, 2021

14:00-14:15	CNT2809	Research on Key Technologies of Spatial Information Acquisition for Non-Circular Signals Based on Array Data <i>Dr. Jiexin Yin, PLA Strategic Support Force Information Engineering University, China</i>
14:15-14:30	CNT2849	Koch Snowflake Fractal Antenna Design in the Deep Space Bands for a Constellation of Cubesat Explorers <i>Dr. Orlando Francois Gonzales Palacios, Universidad Nacional de Piura, Perú</i>
14:30-14:45	CNT2852	The New Wave Effects in the Layered Nonlinear Active and Controllable Structures in THz and IR Ranges and Perspectives Applications <i>Dr. Yu.G. Rapoport, Taras Shevchenko National University of Kyiv, Ukraine</i>
14:45-15:00	CNT2932	SDN-Enabled 3C Resource Integration in Green Internet of Electrical Vehicles <i>Ms. Handi Chen, Dalian University of Technology, China</i>
15:00-15:15	CNT2894	A Novel Dual Mode Decision Directed Multimodulus Algorithm (DM-DD-MMA) for Blind Adaptive Equalization <i>Assoc. Prof. Monika Pinchas, Ariel University, Israel</i>
15:15-15:30	CNT2882	Approach to Define the Reliability of Safety-related Machine Learning Based Functions in Highly Automated Driving <i>Prof. Ossmane Krini, Baden-Wuerttemberg Cooperative State University Loerrach, Germany</i>
15:30-15:45	CNT2870	Securing an IoT Medical System Using AI and a Unidirectional Network Device: Application to a Driver <i>Mr Georges Hajal, IMS laboratory, France</i>
15:45-16:00	CNT2925	Ultra-HD Video Streaming in 5G Fixed Wireless Access Bottlenecks <i>Dr. Koffka Khan, The University of the West Indies, St. Augustine, Trinidad and Tobago, West Indies</i>

Part IV Poster Presentations

Online Poster Guidelines

- All E-Posters will be demonstrated on the official conference website during the conference time.
- Participants could view and share their comments on the website. If any questions on E-posters, kindly contact conference secretary for assistance.
- Signed and stamped electronic presentation certificate would be issued via e-mail after the presentation is delivered.

List of Posters

CNT2919	Detecting of All Zero Blocks in HEVC for RDOQ <i>Nana Shan, Taishan University, China</i>
CNT2933	Video Pre-caching Joint Hand-off and Content Delivery in Multi-access Edge Computing based EONs <i>Yutong Chai, State Key Lab of Information Photonics and Optical Communications, China</i>
CNT2934	Research and Implementation of High-Speed Data Streams Symbol Synchronization Algorithm Using Training Sequence in IMDD-OOFDM System <i>Dongsheng Zhang, Beijing University of Posts and Telecommunications, China</i>
CNT2936	Spectrum Availability Aware Routing and Resource Allocation for Point-to-Multipoint Services in Mixed-Grid Optical Networks <i>Feng Wang, State Grid Electric Power Technical Research Institute, China</i>
CNT2937	Low-cost Deployment Scheme of VNF and PNF in Optical Datacenter Networks <i>Jianghua Wei, Beijing University of Posts and Telecommunications, China</i>
CNT2938	Complex-Coefficient Microwave Photonic Filter Based on Orthogonally Polarized Optical Single-Sideband Modulation <i>Jinwang Qian, Zhengzhou University of Aeronautics, China</i>
CNT2939	Node Importance based Protection in Power-Grid Optical Backbone Communication Networks <i>Xiaobo Li, State Grid Ningxia Electric Power Co. LTD, Information Communication Corporation, China</i>
CNT2941	ReDCN: A Dynamic Bandwidth Enabled Optical Reconfigurable Data Center Network <i>Xinwei Zhang, Beijing University of Posts and Telecommunications, China</i>
CNT2943	Routing Optimization Based on OSPF in Multi-layer Satellite Network <i>Mingjiang Fu, Beijing University of Posts and Telecommunications, China</i>

CNT2945	<p>Data Augmentation Algorithm Based on Generative Antagonism Networks (GAN) Model for Optical Transmission Networks (OTN)</p> <p><i>Liang Chen, Information and Communication Branch of State Grid Corporation of China, China</i></p>
CNT2946	<p>OSNR Prediction based on Federal Learning in Multi-domain Optical Networks</p> <p><i>Junhua Huang, Information and Communication Branch of State Grid Corporation of China, China</i></p>

Part V Best Paper Awards

Electronics, Communication and Networks coexist and it is not possible to conceive the current society without any of the previous terms. 6G network is currently under development and more researchers are joining the research on 6G. Additionally, some chips able to operate at the Terahertz (THz) scale have been already introduced. Probably, next decade would be the scenario to observe the consolidation of 6G-based technology as well as lots of compliant devices.

Conference on Electronics, Communications and Networks (CECNet) series has been established as a mature event after ten previous years of existence. CECNet is held annually covering many interrelated groups of topics such as:

- Electronics technology.
- Communication engineering and technology.
- Wireless communications engineering and technology.
- Computer engineering and technology.

Aim of the Award

Since its foundation in 2011, CECNet conference has developed rapidly along with an annual increase of submissions and continuous improvement of manuscript quality. To attract more scholars to deliver the latest research findings and encourage more presentations and exchanges at the conference, the Best Paper Award is set up for excellent contributors.

The conference organizing committee will choose the 5 best papers from the conference submissions, winners of the top 5 papers will receive certificates issued by CECNet2021 as well as a bonus of ¥1000 each.

The Selection Process

The selection of winners will undergo a 3-step process.

A. Peer review by Technical Program Committee (TPC)

B. Based on peer review comments, Organizing Committee selects the top 15 papers with Straight-A in novelty, structure, significance and language etc.

C. Award Committee selects the best 5 papers from the top 15.

About the Awards

The winner of five best papers will be announced at the closing ceremony, the authors will be also notified by email after the conference. It is necessary for the representative of each paper to attend the conference. The awards as follows:

Bonus of RMB 1000 (¥) with Certificate from CECNet2021

Part VI Acknowledgements

On behalf of the Organizing Committee of CECNet2021, we would like to take this opportunity to express our sincere thanks to *Beijing University of Posts and Telecommunications* and *State Key Laboratory of Information Photonics and Optical Communications*, as well as the great support and contributions of participants from all over the world. We would also like to express our sincere acknowledgements to the Technical Program Committee members who have given their professional guidance and valuable advice to the conference. Below are the lists of the Technical Program Committee members. For those who contribute to the success of the conference organization without listing the name here, we would love to say thanks as well.

Conference Chair:

Prof. Shanguo Huang, State Key Laboratory of Information Photonics and Optical Communications, Beijing University of Posts and Telecommunications, China

Prof. Qixin Guo, Department of Electrical and Electronic Engineering, Director of Synchrotron Light Application Center, Saga University, Japan

Prof. Yuhong Dai, Researcher, Academy of Mathematics and Systems Science, Chinese Academy of Sciences, China

TPC Chair:

Prof. Yongli Zhao, Beijing University of Posts and Telecommunications, China

Prof. Yafeng Liu, Researcher, Academy of Mathematics and Systems Science, Chinese Academy of Sciences, China

Track Chair:

1. Electronics Technology and VLSI

Prof. Zhaolong Ning, Chongqing University of Posts and Telecommunications, China

2. Communication Networks and Network Security

Prof. Bingli Guo, Beijing University of Posts and Telecommunications, China

3. Systems Science and Information Communication

Prof. Cong Sun, Beijing University of Posts and Telecommunications, China

4. Information Functional Materials and Devices

Prof. Ke Bi, Beijing University of Posts and Telecommunications, China

Technical Program Committee:

Dr. Apurva Kumari, Associate Professor, Department of Electronics and Communication Engineering, BVRIT, Narsapur Campus, India

Dr. Balasubramanian Padmanabhan, Hardware and Embedded Systems Lab, School of Computer Science and Engineering, Nanyang Technological University, Singapore

Dr. Bhagyashri R Hanji, Associate Professor, Computer Science and Engineering, Global Academy of Technology, India

Dr. Dagang Jiang, Associate Professor, School of Astronautics and Aeronautics, University of Electronic

Science and Technology of China, China
Dr. Daming Feng, CGG, USA
Dr. Daniele Giusto, Professor, Department of Telecommunications, University of Cagliari, Italy
Dr. Di Yuan, Harbin Institute of Technology, Shenzhen, China
Dr. Do Duy Tan, Computer and Communication Engineering Department, Ho Chi Minh City University of Technology and Education, Vietnam
Dr. Fabi Zhang, Professor, Guangxi Key Laboratory of Precision Navigation and Application, Guilin University of Electronic Technology, China
Dr. Feng Shen, University at Buffalo, The State University of New York, USA
Dr. He Xiao, Cadence Design Systems, Inc, USA
Dr. Jency Rubia J, M.A.M College of Engineering and Technology, Anna University, India
Dr. Kang Chia Chao, Electrical and Electronic Engineering, Xiamen University Malaysia, Malaysia
Dr. Kisalaya Chakrabarti, Professor, Department of Electronics and Communication Engineering, Haldia Institute of Technology, India
Dr. Li Xiang, Associate Professor, Guilin University of Electronic Technology, China
Dr. Mudassar Raza, University of Science and Technology of China (USTC), China
Dr. Naceur Aounallah, Associate Professor, Department of Electronic and Telecommunications, University of Ouargla, Algeria
Dr. Nagesh Deevi, Associate Professor, Pragati Engineering College, India
Dr. P. Kuppusamy, Professor, Madanapalle Institute of Technology and Science, Madanapalle, Andhrapradesh, India
Dr. Ozlem Boydak, Engineering and Natural Sciences Faculty, Mechanical Engineering Department, Istanbul Medeniyet University, Turkey
Dr. Peixian Zhuang, Tsinghua University, Beijing, China
Dr. Prateek Asthana, Bharat Institute of Engineering and Technology, India
Dr. Raveendra K, Koneru Lakshmaiah Educational Foundation, India
Dr. Resul Daş, Professor, Department of Software Engineering, Technology Faculty, Firat University, Turkey
Dr. Serdar SOLAK, Information System Engineering, Kocaeli University, Turkey
Dr. Smt. Rachana C R, Associate Professor, DoS in Computer Science, PG Wing of SBRR Mahajana First Grade College (Autonomous), Pooja Bhagavat Memorial Mahajana Education Centre, India
Dr. Subrato Bharati, Institute of Information and Communication Technology, Bangladesh University of Engineering and Technology, Bangladesh
Dr. S.Suresh, Professor, Department of Computer Science and Engineering, P. A. College of Engineering and Technology, India
Dr. Suresh Raikwar, Associate Professor, Department of Computer Engineering and Applications, GLA University, India
Dr. Tan Sin Jin, School of Engineering, UOW Malaysia KDU, Malaysia
Dr. Wei Lu, Air Force Early Warning Academy, China
Dr. Yifei Zhao, Mettler-Toledo Safeline Ltd, UK