2023 International Symposium on Electronic Information and Communication Technology (ISEICT 2023)

Hefei, China • April 16-18, 2023

http://www.iseict.org

Conference Program

Organizers

Key Laboratory of Electromagnetic Environmental Sensing of Anhui Higher Education Institutes

Organizing Committee

General Chair:

Zhixiang Huang, Anhui University

TPC Chair:

Yingsong Li, Anhui University

TPC Co-Chair:

Lixia Yang, Anhui University

TPC Members:

Xingang Ren, Anhui University

Ming Fang, Anhui University

Kaikun Niu, Anhui University

Guoda Xie, Anhui University

Liping Li, Anhui University

Yongchun Miao, Anhui University

Naixing Feng,Anhui University

Guangshang Cheng, Anhui University

Welcoming Message from General Co-Chairs

On behalf of the ISEICT 2023 Organizing Committee, I would like to welcome you all to the 52023 International Symposium on Electronic Information and Communication Technology (ISEICT 2023), which is organized by Anhui University and Information Materials and Intelligent Sensing Laboratory of Anhui Province, Key Laboratory of Intelligent Computing & Signal Processing, Ministry of Education, Key Laboratory of Electromagnetic Environmental Sensing of Anhui Higher Education Institutes.

The ISEICT is intended to provide an international forum for exchanging new ideas, thoughts, and achievements on Microwave Systems, Radar, RF, Antennas, Propagation, and Scattering, Signal Processing (SP) and Information Technology, and Communications and Network, and the related fields. We are confident that the ISEICT is a conference of international level which provide a connection between the RF, microwave and antenna to the wireless communication networks, and even to signal processing.

The conference has now become an important event in the calendar of the electronic and information areas in the world. We are sure that there will be decisive deliberations during the days of the conference. The city of Hefei has strong development potential in the electronic and information, even in the Artificial Intelligence era. Hefei has blooming in auto industry, chips and information, and it has connected with Europe, Korea, Japan and other Asian countries. Many cultures and products have been exported to the world, and the famous Huangshan and Jiuhua Mountains lie in Anhui Province. I hope you all to enjoy your interest in Hefei as well as your professional activity.

The conference of ISEICT 2023 is hosted hybrid since the COVID-19 has just gone, while all the virtual conference rooms are open to all audiences under the effort of Local Chairs. Prof. Zhixiang Huang. The members of the Organizing Committee and the Technical Program Committee have strived hard for many months to make this conference a reality. I wish to thank them all on behalf of the ISEICT 2023. Finally, we would like to express my sincere thanks to all participants, delegates and guests and wish them all a very pleasant and memorable days during the conference.

Prof. Zhixiang Huang

General Chair of ISEICT 2023

April 16-18, 2023

Invited Speakers

People and crowd behavior identification in video

Sergey Ablameyko

Abstract:

People and crowd motion analysis is an important task in many applications and it is widely used in video surveillance systems to prevent many undesirable events and cases.

We show a formalization of the problem of detection and tracking of people and crowd in video. At first, we defined person, group of persons and crowd motion detection types and formalized them. For crowd, we defined three main types of its motion: direct motion, aggregation and dispersion. Then, we defined crowd behavior parameters and especially crowd abnormal behavior detection features. Based on these formalizations, we developed algorithms for detection and tracking people and crowd in video sequences for indoor and outdoor environment.

A novel method based on integral optical flow will be shown to analyze crowd motion and identify aforesaid crowd behaviors for videos obtained by stationary cameras in public places. We accumulate basic optical flows to form integral optical flow and use it to separate background and foreground and obtain intensive motion regions. Based on information extracted from integral optical flow, we analyze pixel motions statistically for each frame to obtain quantity of pixels moving toward or away from each position and their comprehensive motion at each position.

We then define and compute regional motion indicators to describe motions at region-level. Thresholds for motion intensity, quantity and motion direction of pixels are used together to segment regional motion maps and identify crowd behaviors.

The speech also presents the formalization of the detection and tracking of people of abnormal behavior in video sequences. The criteria characterizing: the quality of detection of accompanied objects, the accuracy of determining the location of the object on the frame, the trajectory of movement, the accuracy of tracking a variety of objects are considered. Based on the considered generalization, algorithms have been developed for detecting abnormal behavior and the type of people using tracking through detection and convolutional neural networks to detect people and form signs. Neural network features are included in a composite descriptor, which also contains geometric and color features to describe each detected person in the frame.

Experimental results will be shown that confirm that our method can identify and locate the crowd behaviors successfully.

Sergey Ablameyko is Academician of National Academy of Sciences of Belarus and Academician of the European Academy, Fellows of IEE, IAPR, NAS, BEA, IAIPT, AE, SRAD and AAIA. Currently, he is a professor of Belarusian State University. He has published more than over 450 scientific papers, 15 books.

Accurate Electromagnetics and Antenna Simulations using the FDTD Method

Atef Z. Elsherbeni

Abstract:

This presentation will focus on recent developments in the finite difference time domain (FDTD) method for the solution of several electromagnetic and antenna problems. First a brief introduction of the method, its unified formulation, its capabilities, and the integration of linear and non-linear circuit elements in the electromagnetic simulation. Several examples of designing antennas, filters, and RFID tags as well as RCS computations of large targets will be demonstrated. This will be followed by the demonstration of how to examine the numerical results to accurately achieve successful simulations and how to eliminate numerical or geometry assignment errors. The speed up of the FDTD method using graphical processing gaming cards (GPUs) along with the use of different programming languages such as FORTRAN, MATLAB, CUDA, and OpenCL will be highlighted.

Atef Z. Elsherbeni received an honor B.Sc. degree in Electronics and Communications, an honor B.Sc. degree in Applied Physics, and a M.Eng. degree in Electrical Engineering, all from Cairo University, Cairo, Egypt, in 1976, 1979, and 1982, respectively, and a Ph.D. degree in Electrical Engineering from Manitoba University, Winnipeg, Manitoba, Canada, in 1987. He started his engineering career as a part time Software and System Design Engineer from March 1980 to December 1982 at the Automated Data System Center, Cairo, Egypt. From January to August 1987, he was a Post-Doctoral Fellow at Manitoba University. Dr. Elsherbeni joined the faculty at the University of Mississippi in August 1987 as an Assistant Professor of Electrical Engineering. He advanced to the rank of Associate Professor in July 1991, and to the rank of Professor in July 1997. He was the Associate Dean of the college of Engineering for Research and Graduate Programs from July 2009 to July 2013 at the University of Mississippi. He then joined the Electrical Engineering and Computer Science (EECS) Department at Colorado School of Mines in August 2013 as the Dobelman Distinguished Chair Professor. He was appointed the Interim Department Head for (EECS) from 2015 to 2016 and from 2016 to 2018 he was the Electrical Engineering Department Head. He spent a sabbatical term in 1996 at the Electrical Engineering Department, University of California at Los Angeles (UCLA) and was a visiting

Professor at Magdeburg University during the summer of 2005 and at Tampere University of Technology in Finland during the summer of 2007. In 2009 he was selected as Finland Distinguished Professor by the Academy of Finland and TEKES.

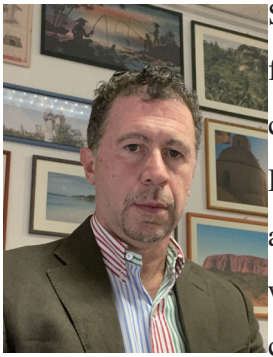
Over the years, Dr. Elsherbeni participated in acquiring millions of dollars to support his research group activities dealing with scattering and diffraction of EM waves by dielectric and metal objects, finite difference time domain analysis of antennas and microwave devices, field visualization and software development for EM education, interactions of electromagnetic waves with human body, RFID and sensor Integrated FRID systems, reflector and printed antennas and antenna arrays for radars, UAV, and personal communication systems, antennas for wideband applications, and measurements of antenna characteristics and material properties. Dr. Elsherbeni is IEEE life fellow and ACES fellow. He is the Editor-in-Chief for ACES Journal, and a past Associate Editor to the Radio Science Journal. He was the Chair of the Engineering and Physics Division of the Mississippi Academy of Science, the Chair of the Educational Activity Committee for IEEE Region 3 Section, and the general Chair for the 2014 APS-URSI Symposium and the president of ACES Society from 2013 to 2015. Dr. Elsherbeni is selected as Distinguished Lecturer for IEEE Antennas and Propagation Society for 2020-2023.

Wireless Power Transfer Systems in Complex Environments: Data Transfer And Shielding Issues

Sami Barmada

Abstract:

Power transfer based on the magnetic resonance and near-field coupling of two-loop resonators was reported by Tesla. The principle, operating and the EMC shielding will be presented, including the passive shielding, passive loops, active loops and the power communication systems. Here, several examples are also presented to discuss the power transfer systems.



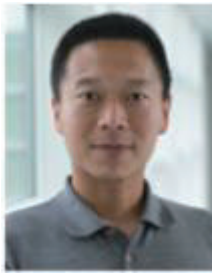
Sami Barmada received the M.S. and Ph.D. degrees in electrical engineering from the University of Pisa, Italy, in 1995 and 2001, respectively. He currently is Full Professor with the Department of Energy and System Engineering, University of Pisa. His research activity is mainly dedicated to applied electromagnetics, EM fields calculation, power line communications, wireless power transfer devices, non destructive testing. He is author and coauthor of more than 150 papers in indexed international journals and refereed conferences. He was recipient of the John F Alcock Memorial Prize (2004): awarded annually to a paper published by the Institution of Mechanical Engineers which concentrates on technical innovation in the railway traction field (S. Barmada, A. Landi, M. Papi, L. Sani, “Wavelet Multiresolution Analysis for Monitoring the Occurrence of Arcing on Overhead Electrified Railways”).Prof. Barmada is a Senior Member of the IEEE and Fellow of the Applied Computational Electromagnetics Sociey (ACES). He served as ACES President from 2015 to 2017, he is a member of the International Steering Committee of the CEFC Conference (Conference on Electromagnetic Field Computation), editor in chief of the ACES Journal of the and he has been general chairman and technical program chairman of many international conferences.

Recent R&D activities on metrology for emerging wireless technologies at the UK National Physical Laboratory

Tian Hong LOH

Abstract:

A raft of advanced wireless technologies for 5G and beyond is increasingly emerging in the arena of modern new radio (NR) wireless communication devices and systems design. This includes the utilization of large-scale antenna configuration, millimetre wave (mm-wave), sub-THz and optical frequencies. This talk presents an overview of the measurement challenges of over-the-air (OTA), RF exposure and propagation channel for emerging wireless technologies, the relevant international activities as well as the measurements capabilities at NPL established under several UK and EU programmes. The topics covered include massive multiple-input-multiple-output (MIMO), MIMO-OTA, mm-wave hybrid beamforming with large-scale phased arrays, data handling for 3D holographic displays application using mm-wave and light fidelity (Li-Fi) techniques, location-awareness full mesh internet-of-things (IoT) network for indoor and outdoor scenarios, connected autonomous vehicles (CAV) communications, novel 5G antenna designs, reconfigurable intelligent surfaces, etc.



Tian Hong Loh is a Principal Scientist at NPL. He leads work at NPL on a wide range of applied electromagnetic metrology research areas to support the telecommunications industry. He is also a Visiting Professor at the University of Surrey, U.K., and the Vice-Chairman of UK URSI (International Union of Radio Science). He holds six patents, one book, and nine book chapters. He has authored and co-authored over 200 refereed publications. His research interests include beyond 5G communications, smart antennas, small antennas, metamaterials, body-centric communications, wireless sensor networks, electromagnetic compatibility, and computational electromagnetics.

Single RF Chain Full-Duplex Multi-Antenna Relays Versus Passive Reflecting Intelligent Surfaces

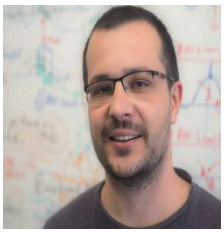
Nikola Zlatanov

Abstract:

In this work, we investigate a single RF chain multi-antenna full-duplex (FD) relay built with b-bit analog phase shifters and passive self-interference cancellation. Next, assuming only passive self-interference cancellation at the FD relay, we derive the achievable data rate of a system comprised of a source, the proposed FD relay, and a destination. We then compare the achievable data rate of the proposed FD relaying system with the achievable data rate of the same system but with the FD relay replaced by an ideal passive RIS.

Our results show that the proposed relaying system with 2-bit quantized analog phase shifters significantly outperforms the RIS-assisted system. In fact, the performance gains are so large, at least for small to intermediate numbers of antenna elements, that we believe it makes this result of interest to the wireless community.

The proposed FD relay can also be built with reconfigurable holographic surfaces, one surface for the transmit-side and one for the receive-side. For such a scenario, we derive the energy efficiency of the relay-assisted system and compare it with the RIS-assisted system. Our numerical results show that the energy efficiency of the relay-assisted system built with reconfigurable holographic surfaces is significantly higher than the energy efficiency of the RIS-assisted system.



Nikola Zlatanov was born in Macedonia. He received his Dipl.Ing. and Master degrees in electrical engineering from Ss. Cyril and Methodius University, Skopje, Macedonia in 2007 and 2010, respectively, and his PhD degree from the University of British Columbia (UBC) in Vancouver, Canada in 2015. In 2015, he became a Lecturer and in 2020 a Senior Lecturer in the Department of Electrical and Computer Systems Engineering at Monash University in Melbourne, Australia. From 2022, he has been a Professor at Innopolis University, Russia.

His current research interests include wireless communications, information theory, and machine learning.

Dr. Zlatanov is the receptian of the Vanier Canada Graduate Scholarship in 2012, best journal paper award from the German Information Technology Society (ITG) in 2014, best conference

paper award at ICNC in 2016, and the ARC Discovery Early Career Researcher Award (DECRA) in 2018.

Dr. Zlatanov served as an Editor of IEEE Communications Letters in the period 2015-2018, and as an Editor of IEEE Wireless Communications Letters 2020-2023.

Technologies of electromagnetic compatibility, electromagnetic protection & electromagnetic safety at system level

Vladimir Mordachev

Abstract:

The following technologies for the analysis and design of electromagnetic compatibility (EMC), electromagnetic protection (EMP), electromagnetic safety (EMS), and electromagnetic ecology (EME) at system level are developed in Belarusian State University of Informatics and Radioelectronics (BSUIR).

1. Technique for system-level discrete linear analysis (DLA) of EMC & EMP of local on-board and ground-based systems and objects.

2. Technique for discrete nonlinear analysis (DNA) & behavior simulation of radio receivers for the design of EMC & EMP.

3. Automated Double-Frequency Test Technique (ADFTT) and System (ADFTS) for EMC testing of radio receivers and radio components.

4. Specialized Geoinformation Technique and Software (GIS RF) for EMC analysis & design of spatially distributed complexes of radio systems.

5. Virtual Testing Area (VTA) for EMC design in spatially distributed complexes of radio systems of various radio services

6. Technique for system-level analysis of EME & EMS of 2G/3G/4G/5G/6G ... mobile communications

The world priority of BSUIR in development of Hi-Tech products for EMC, EMP, EMS & EME design at system level is confirmed by the following:

- by its traditional special sessions and presentations on the top-level international symposiums and exhibitions in USA, Canada, China, Japan, Russia, Germany, Great Britain, Belgium, France, Switzerland, Spain, Italy, Poland, India, etc.;
- by scientific publications in leading IEEE and EU journals;
- by export of Hi-Tech products and services on area of EMC and EM protection in 10 countries;
- by great practical experience in solving the most complex EMC, EM protection, EM safety & EM ecology problems as a key organization in this field in Belarus;

- by the wide international scientific and technical cooperation with experts from Canada, USA, China, Israel, Italy, Great Britain, Russia, Austria, and other countries.

Vladimir Mordachev was born in Vitebsk, Belarus. He received the M.S. degree (with honors) and the Ph.D. degree in radio engineering from the Minsk Radio Engineering Institute, Minsk, Belarus, in 1974 and 1984, respectively. He received an academic rank of Senior Scientist in 1985.

His current research interests include electromagnetic compatibility, mobile communications, electromagnetic ecology and safety, spectrum management, wireless network planning, computer-aided analysis and design, radio-frequency equipment & systems modeling, simulation and testing. He is extensively involved in consulting to wireless network operators, industry and the local government. He is a founder and head of the R&D Electromagnetic Compatibility Laboratory, Belarusian State University of Informatics and Radioelectronics, Minsk, Belarus. He has authored or coauthored more than 250 scientific publications, including 2 scientific monographs, about 200 journal articles and conference papers and 36 patents.

V. Mordachev is a member of IEEE. During the last decade, he has been the head of the annual special sessions of the European and Joint Symposium on EMC.

Analysis of Impact of Electromagnetic Environment on Active Phased Array Systems

Eugene Sinkevich

Abstract:

The following topics concerned the analysis of impact of Electromagnetic Environment (EME) on Active Phased Array (AAA) Systems will be considered.

1.Analysis of interference or impact of pulsed and non-pulsed electromagnetic environment on active phased array systems.

2.Analysis of interference influence mechanism and characteristics of interference in time and frequency domains; explanation of IEC 61000-2-13 standard.

3.Testing, modeling and risk assessment of the impact of electromagnetic environment on active phased array antenna systems

3.1Analysis of the susceptibility of active phased array system and equipment (including antenna); damage threshold analysis of equipment impacted by pulsed and non-pulsed electromagnetic environment.

3.2Mathematical modeling of the impact of electromagnetic environment on the equipment of the active phased array system and analysis of the results.

3.3Effective protection technologies and methods, including shielding, frequency filtering, and nonlinear limiting.

Eugene Sinkevich is with the EMC R&D Lab., BSUIR since 2005. He is currently Vice-Head of Laboratory, Senior Researcher, and principal designer of national and international R&D projects. His research areas include electromagnetic compatibility and protection, RF & microwave measurements, wireless systems and devices. He is author of more than 40 scientific publications, including more than 25 papers in peer-reviewed international journals and conference proceedings. E. Sinkevich is a member of IEEE since 2011.

Smart diagnosis though artificial intelligence in various applications

Jia Uddin

Abstract:

In industry 4.0, artificial intelligence (AI) based smart devices are widely used in different applications such as smart healthcare, smart-factory, smart home, smart city, etc. Smart devices use different sensors to collect real-time data from the environment and the data are used in the AI models. Earlier AI models are mostly machine learning-based models where feature engineering plays a vital role in the diagnosis (detection and prediction). Optimal feature selection is a key issue in Machine learning (ML) models and is a challenging task as features change with the environments. To overcome the limitations of ML models, deep learning models are used nowadays, where deep features are automatically extracted for diagnosis. Computational complexity is a major concern in deep learning models and the availability of limited datasets in various applications. Nowadays, to deploy the deep learning-based diagnosis models in portable devices different key techniques like transfer learning, self-supervised learning, few shot-learning, etc. are playing a vital role in the smart diagnosis for various applications.

Dr. Jia Uddin is an Assistant Professor in Artificial Intelligence and Big Data Department, at Endicott College, Woosong University, South Korea, and an Associate Professor (On Leave), Computer Science and Engineering Department at Brac University, Dhaka, Bangladesh. He received Ph.D. in Computer Engineering from the University of Ulsan, Korea, in January 2015 and M.Sc. in Telecommunications from Blekinge Institute of Technology, Sweden in June 2010. He was an Assistant Professor in the CSE department at BRAC University and the CCE department at International Islamic University Chittagong, Bangladesh. He was invited as a visiting faculty member at the School of Computing, Staffordshire University, Stoke-on-Trent, United Kingdom funded by a European Union Grant in April 2017, and was invited to Professor at Telkom University, Indonesia in Summer 2021. Dr. Jia received the Best Research Faculty award in the 2016 academic year at BRACU for his outstanding research contributions in the area of multimedia signal processing. He is supervising several undergraduate and graduate thesis students and his research students' papers won Best paper awards in several international conferences: ICEEICT-2016, ICCIT-2016, IEEE ICAEE-2017, ICERIE-2017, ICMIP2019, IHCI2020, and IVIC2021. Dr. Jia is the author of 3 books related to Data Science and Computer Vision published by Woosong publisher and has 47 SCI/Scopus indexed Journal publications.

Dr. Jia is involved with different research communities at home and abroad by serving as a member of the organizing committee, technical committee, technical Session Chair, and reviewers in different peer-reviewed journals: IEEE Access, Multimedia Tools and Applications (Springer), Journal of Supercomputing (Springer), Wireless Personal Communication, SAI Journal, Neural Computing and Applications (Springer), Journal of Information Processing Systems, etc. His research interests include fault diagnosis, computer vision, and multimedia signal processing.

Architecture and Communication Protocol for CRN and A SDR-driven Service

A.K.M. Muzahidul Islam

Abstract:

In the recent times, we have experienced a rapid development in wireless technologies. This exceptional advancement has triggered an escalating demand for new radio spectrum. As a result, these technologies may suffer from the spectrum scarcity issue as spectrum is a finite precious natural resource and most of the spectrum bands have been allocated. Cognitive Radio Network (CRN), is expected to utilize radio spectrum efficiently and is also considered to be an intelligent and self-organized communication system that has the ability to adjust its functionality depending on the network environment. In this study, we discuss a cluster-based architecture for cognitive radio ad-hoc networks. We also discuss communication protocol on this architecture. Moreover, we show a software defined radio (SDR) driven cellular network system which can be deployed in a disaster-hit area to provide service to the affected population for free voice and message communication with the search and rescue (SAR) team members.

Prof. Dr. A.K.M. Muzahidul Islam is a Professor in the department of CSE at United International University (UIU), Bangladesh and Visting Professor of Universiti Teknologi MARA (UiTM), Shah Alam, Malaysia.

He has received M.Sc. in Computer Science and Engineering from Kharkiv National University of Radio Electronics (NURE), Ukraine in 1999 and D.Eng. in the field of Computer Science and Engineering from Nagoya Institute of Technology (NiTech), Japan in 2007. From January 2011 until January 2017, he has served as a Senior Lecturer at Malaysia-Japan International Institute of Technology (MJIIT) of Universiti Teknologi Malaysia (UTM), Malaysia. Thereafter, he has served as an Associate Professor and Head of the department of Computer Science and Engineering (CSE) at University of Liberal Arts Bangladesh (ULAB), Bangladesh until September 2018. His research interests include Network Architecture, Communication Protocol, Cognitive Radio Network, Wireless Sensor Network, IoT, Cloud Computing, Healthcare, Smart Farming, etc. Dr. Muzahid has published **101 international research publications** (including 1 edited book, 2 book chapters, 31 peer-reviewed Indexed Journals and 67 Conference Papers). He has secured several National and International Research Grants and supervised 07 PhD, 04 MSc and 25+ BEng students through their graduation. Dr. Muzahid was a Member of Sectoral Committee of BAETE, IEB from

September 2021 to August 2022. He is serving as the Student Activity Coordinator of IEEE Bangladesh Section 2021 - 2022.

Prof. Muzahid is the Initiator and General Chair of International Conference on Bangabandhu and Digital Bangladesh (ICBBDB 2023 and ICBBDB 2021) and the lead Editor of the book “Bangabandhu and Digital Bangladesh”, published by Springer CCIS in 2022. He is also the initiator and TPC Chair of ICAICT Int’l Conferences e.g., ICAICT 2016 and ICAICT 2020. He has also served as the TPC Chair of ETCCE 2020 and 2021 Int’l Conferences. Earlier he has served as the Secretariat of ICaTAS 2016 Int’l Conference, Malaysia and the 7TH AUN/SEED-Net 2014 Int’l Conference on EEE. Dr. Muzahid is a Chartered Engineer (CEng), Senior IEEE Member (SMIEEE) and a Fellow IEB (FIEB).

UAV-aided eMBB and mMTC Services in Unlicensed Band

Saifur Rahman Sabuj

Abstract:

The Unmanned Aerial Vehicle (UAV) wireless network is a new type of service in the sixth generation (6G) designed to support new services and applications that need low-latency (end-to-end delay) and reliability. The integration of unmanned aerial vehicles (UAVs) into spectrum-sharing cognitive radio networks can provide numerous advantages for massive connectivity services in 6G communications; thus, this presentation provides an overview of the performance of cognitive UAV-assisted enhanced mobile broadband communication (eMBB) and massive machine-type communication (mMTC) services. While an eMBB is built to handle high data rates and a larger coverage area, a mMTC service need improved energy efficiency and connection probability. In particular, a cognitive UAV uses the unlicensed wireless spectrum to act as a secondary base station or relay for users or devices on the ground.

The implementation of cognitive UAV in wireless networks is covered in this presentation. Concepts from the perspectives of the physical layer and information theory are highlighted.

Saifur Rahman Sabuj is currently working with the department of Electrical and Electronic Engineering as an Assistant Professor at Brac University, Bangladesh. Mr. Sabuj obtained the Korea Research Fellowship Award from December 2019 to November 2021 and the Brain Pool Fellowship Award from December 2021 to December 2022. From 2008 to 2013, he was a faculty member of Green University of Bangladesh, Metropolitan University, Sylhet and Bangladesh University. Mr. Sabuj received a Ph.D. degree in the Graduate School of Engineering, Kochi University of Technology, Japan in 2017. His research interests include MIMO-OFDM/NOMA, Cooperative Communication, Cognitive Radio, Internet-of-things, Unmanned Aerial Vehicle and Machine-to-machine for wireless communications.

Machine Learning and its uses in Human Action Recognition

ABDULLAH-AL NAHID

Abstract

Human activity recognition (HAR) is the process of automatically determining a person's activity based on sensor data. HAR is used in a wide range of industries, such as healthcare, sports, security, and human-computer interaction. The use of HAR allows for the tracking of elderly or disabled individuals' movements and the detection of any unusual behavior. It can be used in offices to monitor worker movement and identify potential risks like injuries from repetitive motion. Security applications that use HAR can alert authorities right away to any suspicious activity. HAR systems typically use sensors like accelerometers, gyroscopes, and magnetometers in devices such as smartphones, smart-watches, and fitness trackers to collect data on human movement. Machine Learning (ML) algorithms can then examine the data to identify actions like standing, sitting, and running. For HAR tasks, ML techniques are frequently employed. CNNs are frequently used in tasks involving image and video analysis, and they have also been used in HAR. RNNs can detect temporal dependencies in sensor data because they are made to handle sequential data. RNNs have been used in HAR tasks like gesture recognition where the order of sensor data is crucial. Long Short-Term Memory's (LSTM) have been used for HAR tasks like identifying a series of physical exercises where the length of an activity varies. In HAR tasks, where the learned features are fed into a classification model, autoencoders can be used for feature extraction. Overall, HAR has a wide variety of uses in the human world, from security and home automation to sports and healthcare. We can anticipate seeing even more cutting-edge uses as deep learning-based HAR techniques develop.

Dr. ABDULLAH-AL NAHID received the B.Sc. degree in Electronics and Communication Engineering from Khulna University, Khulna, Bangladesh, in 2007, the M.Sc. degree in telecommunication engineering from the Institute for the Telecommunication Research (ITR), University of South Australia (UniSA), Australia, in 2014, and the Ph.D. degree from Macquarie University, Sydney Australia, in 2018. His research interests include machine learning, biomedical image processing, data classification, and biomedical data analysis. He is a passionate researchers. He has published more than eighty journal articles, conference proceeding. Along with this he has published four book chapters. Due to his outstanding research activities, he has awarded Vice-Chancellor Award's by Khulna University, Khulna-9208, Bangladesh in 2021.

Minimization of interference in Cognitive Radio using Modified Particle Swarm Optimization

Muhammad Kamran Khan

Abstract：

In the recent past, different optimization algorithms have been applied to scientific and engineering research problems and they gave drastic improvements as compared to the other traditional techniques. One of the powerful optimization techniques is particle swarm optimization (PSO), which is a non-derivative but efficient optimization technique. The basic PSO was introduced in 1995 by James Kennedy and Eberhart. Later on, different researchers brought improvements in its performance. In this research paper, a modified PSO applied to the minimization of interference with neighbour channels in the OFDM-based cognitive radio is discussed. The required result has been achieved by inserting two Cancellation Carriers (CCs) at both sides of the OFDM signal. Like the OFDM signal, the CCs also generate the sidelobes. The amplitudes and polarity of the sidelobes are calculated by the proposed modified PSO in such a way, that the interference with close channels will be minimized. The CCs have no data and are added just to minimize the Out of Band (OOB) radiations. By using this technique there would be a minor loss in both the signal-to-noise ratio (SNR) and a little increase in the peak-to-mean power ratio (PMPR).

Muhammad Kamran Khan gotten his PhD in 2019. Now he is a Assistant Professor of University of Peshawar. His research interests are lying on Signal Processing using Metaheuristic Optimization Techniques, Renewable Energy System, Power Electronic Converters, DC-DC Converters for Electric Vehicle charging.

Remotely Health Monitoring (Vital Signs) through various Transform mechanisms

Naeem Khan

Abstract:

Remotely monitoring of health is an interesting research topic and profession. Modern countries have adopted this mechanism since a couple of decades. After the Covid-19, its need and important has been realized almost all over the world. Signal sent through radar, striking an affected person or patient, reflected back, and received through an antenna is subjected to analyzed. Based on various features including health, age and level of disease, various vital signs such as heart rate (HR), respiration rate (RR) etc. are diagnosed. The routine method utilized by the researchers is Fourier Transform (FT) or Fast Fourier Transform (FFT). But it is unable to analyze the data from non-stationary patient – which is a more realistic scenario. For that reason, advance tools like Wavelet transform and Hilbert transform is advised. Another big challenge to be addressed is noise available in the data, for which, Modified and robust Kalman filter (RKF) is proposed. Since, the monitoring is continues and usually for a long period, it possess huge data. It sometimes, leads to congestion of buffer zone and droplet of data, which in term of patient monitoring is very crucial. For that the whole mechanism is modified based on nature of data like AR model, ARMA model etc. Overall, a very promising area is addressed in this research which is society oriented.

Biography

Prof. Dr. Naeem Khan received the B. Sc. degree in Electrical Engineering from UET Peshawar, Pakistan in 2002. He then pursued M. Sc. in Electrical Engineering with specialization in Power Engineering in 2007. He achieved PhD scholarship from HEC to United Kingdom, University of Leicester, in 2007. After completing PhD program, Dr. Naeem returned to Pakistan and joined parent department, UET Bannu Campus as an Assistant Professor in 2011.

His research interest includes Linear & nonlinear system control, Linear parameter varying system and handling interrupted system in the process of state estimation. He has published numerous journal and conference papers in reputed journals and conferences like Automatica, IEEE, CDC and ECE. In addition, one book and several chapters have been written after PhD degree by Dr. Khan. In 2016, established Control systems lab at Bannu where state-of-the-art research is taking place on burning research topics like Remote Health monitoring especially

Heart rate and respiration rate through various techniques such as Fourier Transform, Wavelet Transform and Hilbert Transform under contingent situation. Besides, various new modes of Kalman filters have been proposed that deals robotics and UAV. Based on the satisfactory performance, Dr. Naeem Khan has been promoted to Professor post in 2022 and Head of the department since 2015.

Microstrip Patch Antenna for the Design and development of an RF-based bone health monitoring system

Mohaira Ahmad

ABSTRACT

The major objective of this project is to address bone health diagnosis with cost-effective solutions. Till-date BMD (Bone Mineral Density) analysis is an expensive procedure for bone health diagnosis including heavy duty equipment as well as health and safety procedures. For patients with serious bone health problems like Osteoporosis and fragility fractures, it is difficult to understand the risk of bone fracture on the fly. However, the value of bone mineral density (BMD) can be a good predictor in both scenarios. These fragility fractures arise from low energy traumas in daily activities and are more common in elderly people, and sometimes due to the impairment of BMD due to micro architectural deterioration of bone.

As the number of osteoporosis patients are increasing, we need more reliable method that can helps in detecting this type of cancer in early stages, which will lead to save patient's lives as the earlier the tumor is detected the higher the chance for recovery. Approximately 50% of women and 20% of men are reported to suffer from this bone damage problem over the age of 50. In addition, COVID-19 also has an adverse effect on the osteoporosis patient profile which is now in a state of increase. The BMD test is expensive and also involves exposure of the human body to ionizing radiation for 30-40 minutes which is very harmful.

Therefore, the aim of our project is to design a Micro strip Antenna system that is used for detecting bone health with low cost. Thus, providing the capability of early diagnosis of the onset of osteoporosis and prevention of osteoporotic fractures. In this research work, a micro-strip patch antenna which is the most suitable type of antenna for this task due to its small size, light weight, low profile, easy fabrication and low cost is designed. Furthermore, the frequency band is the ISM band, which is the Industrial, Scientific and Medical band is used in this project (2GHz to 2.8GHz). A Rectangular Microstrip Patch Antenna has been designed for Microwave Imaging (MI) with a frequency range of 2GHz to 2.8 GHz at a resonant frequency of 2.4 GHz.

MOHAIRA AHMAD obtained her B.E. degree in Electrical (Telecom) Engineering from National University of Sciences and Technology, Islamabad, Pakistan, in 2010 and Ph.D degree in Computer Application Technology with specialization in computational electromagnetics from Jiangsu University, China in 2019 under the supervision of Prof Lixia Yang. She is currently an Assistant Professor at the School of Electrical Engineering and Computer Science, National University

of Sciences and Technology, Islamabad, Pakistan. She worked as an Assistant Professor at the Electrical Engineering Department, University of Lahore, Pakistan from 2014 to 2015. She worked as an R&D engineer at National Radio and Telecommunication Corporation from 2010-2012. Her research interest includes computational electromagnetics, graphene based devices, terahertz, reconfigurable antennas and MIMO antennas.

Stochastic Quantification of Phased Array with Random Errors

Qi Wu

Abstract

Various random errors existed in phased array, e.g., T/R module, fabrication tolerance, and mechanical deformation. It is important to understand effects of those random errors, and find possible ways to alleviate those effects.

In this talk, we will introduce two methods for stochastic quantification of phased array with random errors. The first one takes advantage of the information of array manifold, and divide a large array into smaller groups. Each group can be efficiently evaluated through the polynomial chaos expansion (PCE) method. Both the independent and dependent random variables are treated by this method. The second method uses unified neutral network (UNN) for modeling the spatial distributions of the radiated field from phased array. An efficient preprocessing procedure is introduced to improve the convergence of UNN. This UNN model fits phased arrays with similar elements but different array size.

Finally, some measurement results of digital phase shifters are demonstrated and discussed.

Speaker Information

Qi Wu received the B.S. degree from East China Normal University, Shanghai, China, and the Ph.D. Degree from Shanghai Jiao Tong University, Shanghai, China, both in Electrical Engineering, in 2004 and 2009, respectively.

He joined the faculty of School of Electronics and Information Engineering, Beihang University, Beijing, China, in 2009, now he is a Full Professor. During 2011 and 2012, he was a Visiting Scholar in the Department of Electrical Engineering, University of California, Los Angeles. During 2014 and 2016, he was an Alexander von Humboldt Fellow in the Institute of Electromagnetic Theory, Technical University of Hamburg, Germany. He has authored over 40 journal papers, two books, and holds 20 patents as the first inventor. His research interests include broadband antennas, computational electromagnetics, and related EMC topics.

Dr. Wu received the Young Scientist Award from the International Union of Radio Science (URSI) in 2011, the Nominee Award for Excellent Doctoral Dissertation from the National Minister of Education in 2012, Young Scientist Award of APEMC in 2016, and Excellent Researcher from Chinese institute of Electronics in 2020.

Methods for solving multiscale and multiphysics field problems in computational electromagnetics

Niu Kaikun is an Associate Professor and Master's Supervisor in the School of Electronic and Information Engineering at Anhui University. He is a member of the IEEE and the China Electronics Society. He received his Bachelor's degree in 2014 and his Ph.D. degree in 2019 from Anhui University. He worked as a Research Assistant at the University of Hong Kong in 2017 and as a Postdoctoral Researcher at King Abdullah University of Science and Technology in Saudi Arabia in 2019. His research interests include computational electromagnetics, optics, electromagnetic compatibility, and microwave and RF circuit design.

Prof. Niu has led one sub-project of a National Natural Science Foundation of China key project, one Youth project, one Anhui Provincial Natural Science Foundation project, and received funding from the Anhui Provincial Innovative Program for Returned Overseas Scholars. He has also participated as a core member in several National Natural Science Foundation of China key projects and general projects. He has published more than 20 SCI/EI-indexed journal papers (as the first or corresponding author for more than 10 papers) in top international journals such as IEEE Transactions on Antennas and Propagation. He has been granted two invention patents and has served as a reviewer for top international journals including IEEE Transactions on Antennas and Propagation, Journal of Computational Physics, and IEEE Antennas and Wireless Propagation Letters. He has served as a Technical Program Committee (TPC) member for multiple conferences (), as well as a session chair and invited speaker.

基于电磁信息论的多天线技术研究

陈晓明

摘要：

自 4G 起多天线（MIMO）技术在无线通信中发挥了越来越大的作用。大规模 MIMO 成为 5G 的关键技术，在 6G 通信中也将发挥重要作用。5G/6G 多天线技术包含电磁场/天线技术、信道传播和物理层通信，设计一款高性能的多天线系统需要综合考虑天线/信道/通信等方面的因素，而现有的研究往往存在各个领域的割裂。传统天线指标的最优不一定可以保证整体性能的最优，而通信物理层优化往往又没有考虑到天线影响及电磁波动方程的限制。本次报告将尝试从电磁信息论出发，讨论 MIMO 天线耦合和相关性对多天线系统的影响，为 MIMO 天线的综合优化设计提供一种新思路。

陈晓明，西安交通大学电信学部信通学院教授、博士生导师。2012 年 6 月获瑞典查尔姆斯理工大学博士学位，随后留校先后担任博士后。2014 年 10 月加入瑞典 Qamcom 科技公司，作为公司骨干参与包括欧盟 5GPPP 旗舰项目 mmMAGIC 等科研项目。2017 年初回国任教，入选国家人才计划青年项目。陈晓明教授主要研究方向包括：多天线技术、空口测试技术、电磁信息论等，共发表高质量 SCI 期刊论文 170 余篇、学术专著 1 部、章节 4 部。与国际同行合作完成无线通信和互联网协会 CTIA 空口测试标准化制定 1 项（CTIA 01.21 Test Methodology, SISO, Reverberation Chamber），入围全球前 2%顶尖科学家榜单，获 Wiley 中国开放科学高贡献作者，获 2022 年陕西省高等学校科学技术研究优秀成果一等奖（《B5/6G 通信大容量智能天线技术研究》），2017、2018 年连续两年获国际无线电科学联盟青年科学家奖(URSI GASS 2017, URSI AT-RASC 2018)。担任天线传播领域权威期刊 IEEE Transactions on Antennas and Propagation 副主编、IEEE Antennas and Wireless Propagation Letters 高级副主编，续五年获 IEEE 杰出副编辑奖（IEEE outstanding AE awards 2018-2022）。担任 IEEE ICEICT2021 大会主席、ICMMT2021 宣传主席、ICEICT2020 TPC 主席、IEEE 高级会员、中国通信学会无线移动通信委员会委员、天线与射频委员会委员和《电子与信息学报》编委。

类量子电磁超材料

高飞

摘要：电磁超材料是电磁学的前沿研究方向，涉及物理、电磁学/光学、材料等多学科的交叉融合，目标在于探索新型电磁模态及其衍生的新型功能电磁器件，为未来颠覆性信息技术奠定物质基础。通过类比量子材料对物质波（如：电子）的调控；我们课题组聚焦类量子电磁超材料对经典电磁波调控方法的研究。本次报告将介绍我们课题组近年来的研究进展，包括：电磁拓扑绝缘体、辐射型反宇称-时间表面等离激元及其潜在应用等。

高飞，国家青年特聘专家，浙江省特聘专家。2016 年于新加坡南洋理工大学获得博士学位。2018 年加入浙江大学信息与电子工程学院，任浙江大学百人计划研究员，博士生导师。

研究方向为类量子人工电磁结构。已发表 SCI 论文 70 余篇，其中包括 Nature Physics, Nature Materials, Nature Communications, PRL, Advanced Materials 等国际著名期刊。

学术服务：担任 PIERS、IEEE-NEMO 等国际会议分会主席；Progress In Electromagnetics Research (PIER) 副主编；以及多家国际重要学术期刊审稿人，包括 Nature Physics、Nature Communications、PRL、Light Science & Applications、Advanced Materials、Laser & Photonics Reviews 等。

大规模高动态低轨卫星激光组网关键技术研究

赵永利

摘要：

随着全球无缝通信需求的日益迫切，大量低轨卫星需要在空间进行部署和组网。由于微波频谱资源的限制，激光将成为未来卫星通信，尤其是星间通信的重要手段。在大规模、高动态、多尺度等复杂状态约束下，低轨卫星如何完成有效组网成为未来人类面临的重要挑战。本报告将对大规模高动态低轨卫星激光组网的关键技术进行研究，具体涉及载荷约束下的全光交换、高动态路由机制、快速重构技术、风险感知策略等内容，并对未来的发展趋势进行分析和展望。

赵永利，北京邮电大学研究生院副院长，教授，博士生导师，国家优秀青年基金获得者，国家 111 创新引智基地主任，美国加州大学戴维斯分校访问学者，IET Fellow。国家优青，中国通信学会青年科技奖获得者。先后主持和参加国家级科研项目 20 余项，获得国家科技进步二等奖 1 次，省部级科技奖励 15 次。发表高水平期刊论文 100 余篇，出版学术专著 10 部，获得授权国家发明专利 100 余项，提交国际标准建议文稿 100 余篇。主要研究方向包括：内生安全光网络、卫星激光组网、量子互联网、F5G 等。

空间磁学及应用研究

易忠

摘要：主要介绍空间站在轨实验、科学研究与应用，航天器先进装备与测试技术，深空探测中的航天器环境防护与抑制技术，新型空间环境模拟试验及评价技术，航天器健康诊断及可靠性技术，新型空间环境探测及数据分析技术，新型传感技术等。介绍空间电磁学和空间磁场的测量。

易忠，研究员，博士生导师。毕业于北京大学地球物理系，现任北京卫星环境工程研究所总工程师、磁环境专业总师，国防重点实验室副主任，航天科技集团公司学术技术带头人，哈尔滨工业大学兼职教授，《航天器环境工程》杂志主编。获得教育部科技进步一等奖 1 项，国防（军队）科技进步奖 9 项（其中一等奖 1 项，二等奖 1 项），北京市科技进步奖 1 项。获第十届中国青年科技奖，2012 年度“科学中国人”称号，2016 年度北京市百名科技领军人才。

空间动态目标电磁特性认知与调控方法研究

李猛猛

摘要：

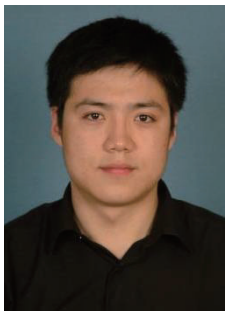
计算电磁学是获取空间动态目标电磁特性、认知特性变化机理、指导调控方案设计的重要手段。报告内容主要包括空间动态目标特性的本征特征获取方法，基于电磁特征变化规律，实现多电磁特征调制的低复杂度设计方法。重点汇报在非合作目标特性认知、低复杂度计算与优化方法、基于时间/空间调制电磁超表面的目标电磁特征调控技术等方面研究进展。

李猛猛，南京理工大学微电子学院教授、博导。主要研究方向为计算电磁学与应用、雷达目标特性与电磁隐身。在 IEEE Transactions on AP 等发表论文 100 余篇，出版专著章节 1 部，国际会议分组特邀报告 10 余次。第一发明人申请和授权专利 20 余项。获得国家优秀青年科学基金项目、江苏省优博、5 次国际会议优秀论文奖，入选江苏省“青蓝工程”中青年学术带头人、ACES 青年科学奖。担任工信部重点实验室副主任，IEEE AP Magazine、IEEE OJAP 副主编。

基于慢波传输线的小型化微波器件和天线

邓敬亚

报告简介：天线和无源电路占据射频收发前端的绝大部分体积。天线和无源电路的设计以波长为单位，是整个无线系统中最难小型化的部分。传统小型化设计方法通常降低了天线与无源电路的电尺寸，往往以牺牲性能为代价，直接导致天线增益等关键指标的降低。本报告提出了基于慢波传输线的小型化微波器件和天线的设计思路，阐述了慢波现象的物理本质，基于慢波特性设计了一系列新型微波器件、天线和阵列，在保证性能的前提下，实现微波器件和天线的小型化。



邓敬亚，西安电子科技大学教授。2011 年在西安电子科技大学获得电磁场与微波技术专业博士学位，2013 年晋升为副教授，2016 年晋升为教授，2020 年获国家自然科学基金优秀青年科学基金。研究方向为天线理论与工程、微波电路与系统、电磁测量和阵列信号处理。发表论文 60 余篇，授权发明专利 17 项，承担国家自然科学基金、装备预研、慧眼行动项目、军委科技委前沿创新特区预研、国防科工局预研、民用航天预研、陕西省重点研发计划项目、教育部联合基金项目等项目二十余项。2020 年获陕西省青年科技奖。

毫米波天线的高性能设计和性能精准评估

赵鲁豫

概要：

2019 年的 WRC-19 大会确定了总共 14.5GHz 的毫米波连续带宽，用于毫米波移动通信。可见在不远的将来，毫米波一定会方兴未艾。在毫米波段，天线和天线阵的设计出现了很多新的挑战和要求，本次报告针对毫米波天线的新要求，提出了一系列高性能设计的方法和原型，并提出了毫米波天线的性能快速精准评估的方法。

赵鲁豫，男，博士，副教授，博士生导师。西安电子科技大学电子信息工程专业本科。后赴香港中文大学电子工程系硕博连读。主要研究方向为耦合谐振器解耦网络与多天线系统。于 2014 年获得博士学位。同年开始在香港中文大学进行博士后研究。并于 2016 年到西安电子科技大学任教。共发表 SCI 检索文章近五十篇，其中 ESI 高被引论文四篇，授权美国发明专利三项，中国发明专利两项，申请美国专利 2 项，中国专利十余项，出版译著一部，专著一部。现任天线产业联盟专家委员会理事。任中国通信学会高级会员，通信学会天线与射频技术专委会委员，IEEE 高级会员。常年担任 IEEE Trans on Antennas and Propagation，International Journal of RF and Microwave Computer-Aided Engineering 等杂志的审稿人。现任 IEEE Access 杂志副主编。

主持国家重点研发计划子课题一项，国家自然科学基金青年项目一项，重点实验室基金一项，装发预研共用技术项目两项，陕西省重点研发计划一项。同时积极参加产学研合作项目，与行业领导及知名企业有着广泛的联系和合作。总项目经费超 1500 万元。同时参与制定国家标准一项。作为指导教师，带队获得第五届物联网+创业大赛省银奖，陕西省科技工作者创新创业大赛银奖。目前主要的研究方向为多天线系统与天线去耦合技术，人工电磁材料及其在天线中的应用，高性能 5G 基站与终端天线，微波平面、非平面电路，微波无源集成电路，毫米波与太赫兹天线，天线与微波测量技术等。

闪电高能辐射现象与试验观测

李鹏

摘要：

闪电高能辐射（Lightning Energetic Radiation，LER）是伴随闪电出现，能量可达数十 MeV 的瞬发 X/γ射线，可能关系到雷电始发机制并影响近地空天活动安全，是地球物理领域最受关注的自然现象之一。近年来，研究团队在 LER 领域持续发力，自主研发了国内首套阵列式宽量程雷暴高能辐射观测系统，设计实现了人工触发闪电/自然闪电高能辐射地面多点多效应同步观测试验，首次开展了基于单事件能谱的源项模型拟合研究，相关成果深化了对 LER 现象特征及其与闪电关系的认识，为揭示 LER 产生机制提供了新的观测证据和思路。后续，我们计划开展精细化多手段协同与空天地协同相结合的立体综合观测研究，进一步推动高能大气物理领域发展。

李鹏，军事科学院防化研究院某研究室主任，研究员，博士生导师，德国柏林工业大学访问学者，原总装备“1153”人才工程第三层次培养对象，中国地球物理学会国家安全地球物理专业委员会委员。近年来，承担军队型号项目、预先研究项目、军内科研重点项目等 15 余项，获军队科技进步二等奖 4 项，三等奖 1 项，获发明专利授权 7 项，发表学术论文 30 余篇，出版专著 1 部。获得授权发明专利 7 项。主要研究方向：核爆效应现象学与探测技术。

基于间隙波导的毫米波电路与天线技术研究

冯文杰

摘要：毫米波频段在军事和民用领域应用广泛，如：E 波段数据回传、77/79GHz 车载自动驾驶雷达传感器、W 波段合成孔径成像雷达毫米波安检仪等；传统机械加工的喇叭天线或波导缝隙天线体积大重量重，不能完全适用于目前集成化和轻量化的车载/机载射频前端系统。为了克服以上难题，国内外学者提出了基片集成间隙波导技术，用于解决毫米波前端小型化和轻量化问题。本报告归纳了基于间隙波导的天线阵列及电路器件技术，给出了基片集成间隙波导馈电网络的天线阵列，同时也介绍了基于基片集成波导技术的带通滤波器、微带过渡转换等。

冯文杰，男, 1985 年 1 月生，2013 年 10 月毕业于南京理工大学，获工学博士学位，现为华南理工大学电信学院教授，博士生导师，曾任电磁仿真与射频感知工信部重点实验室副主任，国家优青(2018)。主要研究领域为微波/毫米波电路与器件。曾获得 2015 年江苏省科学技术二等奖、2021 年中国电子学会科技进步二等奖，2017 年江苏省“青蓝工程”优秀青年骨干教师、2018 年 ACES-China 青年科学家奖等。

主持国家自然科学基金、国家重点研发课题等项目 10 余项，企业横向项目 4 项。在国际期刊和会议上发表论文 230 余篇，其中 SCI 期刊论文 150 余篇 （IEEE Transactions 论文 70 余篇），论文谷歌学术引用 4300 余次，连续多年入选爱思唯尔中国高被引学者。获授权国家发明专利 30 余项，目前担任 4 个 SCI 期刊的副主编，并为多个国际学术刊物审稿人和国际会议的 TPC Chair 和 Session Chair。

三维打印毫米波高增益天线研究进展

李雨键

摘要

毫米波天线在 5G 通信、工业物联网、智慧交通等新一代信息技术应用中发挥着重要作用，是当前天线研究领域的前沿与热点。三维打印具有可一体化实现复杂三维结构的技术优势，能够为毫米波天线研究提供更多的设计自由度，进而提升天线的性能水平。报告将介绍本课题组在基于三维打印技术的毫米波宽带高增益天线方向的研究进展，主要包括毫米波宽带高增益阵列天线、多波束平面反射面天线等。

个人简介：

李雨键，北京交通大学教授，博导，主要研究方向是毫米波太赫兹天线与器件。主持国家重点研发计划专项青年科学家项目、国家重点研发计划专项子课题、国家自然科学基金面上项目等项目 10 余项，获得 2018 年国家自然科学基金“优秀青年科学基金”和 2022 年北京市自然科学基金“杰出青年科学基金”资助。已发表 SCI 检索论文 77 篇，已授权国家发明专利 13 项、美国专利 2 项。获得四川省科技进步一等奖、国际无线电科学联盟青年科学家奖等国内外学术奖励。

A simple RIS-based passive sensing method

Yu Canping

With the development of Symbiotic Sensing and Communications (SSaC), a technique that directly uses communication signals to achieve target localization has attracted more and more attention. This technique, known as passive sensing or device-free sensing, has the advantage of being easy to implement, but traditional passive sensing systems require complex receiving equipment. Reconfigurable intelligent surface (RIS) can flexibly control the electromagnetic characteristics of reflected signals, improve communication system performance, and help build passive sensing systems with only one receiving channel. This report introduces a simple RIS-based passive sensing method to achieve DOA estimation for multiple targets, which can accurately estimate the target DOA under the interference of base station (BS) signals and has low computational complexity.

大会开幕式（Opening ceremony）

<table>
<tr><td colspan="3">2023 年 4 月 14 日下午（April 14, 2023 Afternoon）</td></tr>
<tr><td colspan="3">会议报到、入住酒店 (Registration, Check in)</td></tr>
<tr><td colspan="3">2023 年 4 月 15 日上午（April 15, 2023 Morning）</td></tr>
<tr><td colspan="3">会议报到、入住酒店(Registration, Check in)</td></tr>
<tr><td colspan="3">2023 年 4 月 15 日下午（April 15, 2023 Afternoon）</td></tr>
<tr><td>14:25-14:30</td><td>参加开幕式入席（Experts Seating）</td><td rowspan="6">主持人：胡学文
Hoster: Xuewen Hu</td></tr>
<tr><td>14:30-14:35</td><td>安徽大学介绍(Introduction of AHU)</td></tr>
<tr><td>14:35-14:45</td><td>校领导致辞（AHU）</td></tr>
<tr><td>14:45-14:50</td><td>大会主席致辞（Chair）</td></tr>
<tr><td>14:50-14:55</td><td>ISEICT 启动仪式</td></tr>
<tr><td>14:55-15:00</td><td>大会合影留念（Photos）</td></tr>
<tr><td>15:00</td><td colspan="2">大会开幕式结束 opening ceremony closed</td></tr>
</table>

2023 年 4 月 15 日			
Time	Speaker	Location	Hoster
15:00-15:30	吴琦（Qi Wu）	FengGuan Ting	Kaikun Niu
15:30-16:00	Xiaoming Chen	FengGuan Ting	
16:00-16:30	李鹏（Peng Li）	FengGuan Ting	
16:30-17:00			
17:00-17:30	易忠（Zhong Yi）	FengGuan Ting	
2023 年 4 月 16 日			
Time	Speaker	Location	Hoster
08:30-09:00	Yujian Li	FengGuan Ting	Ming Fang
09:00-09:30	Atef Z. Elsherbeni	Zoom:985 607 6918	
09:30-10:00	Kaikun Niu	FengGuan Ting	Kaikun Niu
10:00-10:30	Break		
10:30-11:00	Mengmeng Li	FengGuan Ting	
11:00-11:30	Fei Gao	FengGuan Ting	
11:30-12:00	Yongli Zhao	FengGuan Ting	
午餐（Lunch）			
13:30-14:00	Jingya Deng	FengGuan Ting	Yingsong Li
14:00-14:30	Luyu Zhao	FengGuan Ting	
14:30-15:00	Nikola Zlatanov	Zoom:985 607 6918	
15:00-15:30		Break	
15:30-16:00	Sami Barmada	Zoom:985 607 6918	Yingsong Li
16:30-17:00	Vladimir Mordachev	Zoom:985 607 6918	
17:00-17:30	Eugene Sinkevich	Zoom:985 607 6918	
2023 年 4 月 17 日			
08:30-09:00	Wenjie Feng	FengGuan Ting	Yingsong Li
09:00-09:30	Yujian Li	FengGuan Ting	
09:30-10:00	Canping Yu	FengGuan Ting	

10:00-10:30	Jia Uddin	Zoom:985 607 6918	Yingsong Li
10:30-11:00	Saifur Rahman Sabuj	Zoom:985 607 6918	
11:00-11:30	Mohaira Ahmad	Zoom:985 607 6918	
午餐			
13:30-14:00	A.K.M. Muzahidul Islam	Zoom:985 607 6918	Yingsong Li
14:00-14:30	Naeem Khan	Zoom:985 607 6918	
14:30-15:00	Muhammad Kamran Khan	Zoom:985 607 6918	
15:00-15:30	Break		
15:30-16:00	Abdullah-al Nahid	Zoom:985 607 6918	Yingsong Li
16:30-17:00	Sergey Ablameyko	Zoom:985 607 6918	
17:00-17:30	Tian Hong LOH	Zoom:985 607 6918	
晚餐			

会议地址

Conference Address

安徽省合肥市经济技术开发区紫云路与青龙潭路交叉口东北角

Opening ceremony：凤冠厅（Fengguan Ting）