

2023 2nd International Conference
on
**Intelligent Computing and
Next Generation Networks
(ICNGN2023)**

17-18 November 2023
Hangzhou, China



IEEE



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Engineering Village

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Note:

1. All the participants are advised to arrive before 08:30, 18 November.
2. Certificate of Participation can be collected at the registration counter.
3. Please copy PPT files of your presentation to the secretary when registration.
4. The organizer doesn't provide accommodation, and we suggest you make an early reservation.
5. If you want to deliver oral presentation but your paper is not in the session list, please contact us by Email: cfp@icngn.org

Instruction about Oral Presentation

Devices Provided by the Conference Organizer:

- Laptops
- Projectors & Screen
- Laser Sticks

Materials Provided by the Presenters:

PowerPoint or PDF files

Duration of each Presentation:

Regular Oral Session: about 10-15 Minutes of Presentation and 3 Minutes of Q&A

Introduction

The 2nd International Conference on Intelligent Computing and Next Generation Networks (ICNGN2023) will be held during November 17-18, 2023 in Hangzhou, China. As an official conference supported by IEEE, ICNGN 2023 has been listed on the official website of IEEE with the ID 59831.

The conference aims to bring together academic and industrial professionals in the field of intelligent computing and next generation networks, and to promote scientific cooperation and exchanges within each other and promote the progress of technology and scientific research in the field. The conference offers keynote speeches, invited speeches, oral presentation sessions, poster sessions and other forms of communication and information exchange. Authors are invited to submit original and not published papers describing new technologies and trends about the topics. The conference proceeding will be published in IEEE Xplore and the CSDL, and finally indexed by Ei-Compendex, SCOPUS, and others.

We believe that ICNGN2023 will definitely offer a more professional and more meaningful chance for the experts and scholars from all over the world. On behalf of the organizing committee, we sincerely invite you to participate in ICNGN2023 as authors, speakers and listeners, and we look forward to meeting you all in Hangzhou!

Organizing Committee of ICNGN2023

Venue

No. 492 Fengqing road, Gongshu, Hangzhou, 310015 Hangzhou, Hilton Garden Inn
Hangzhou Xixi Zijiangang
杭州拱墅区丰庆路492号建冠龙禾商务中心A幢, 杭州西溪紫金港希尔顿花园酒店

Transportation



Metro Station

Sandun

About 20min(s) from hotel by foot (1.4 km)

Dunxiang Street

About 24min(s) from hotel by foot (1.7 km)



Train Station

杭州西站

About 17min(s) from hotel by car (16.9 km)

Hangzhou Railway Station

About 45min(s) from hotel by car (17.3 km)



Airport

Hangzhou Xiaoshan International Airport

About 50min(s) from hotel by car (43.5 km)



Conference Committee

General Chair

Prof. Gyu Myoung Lee, Liverpool John Moores University (LJMU), UK

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Prof. Qinmin Yang, Zhejiang University, China

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Dr. Yao Ge, Nanyang Technological University (NTU), Singapore

Prof. Zheng Han, Central South University, China

Dr. Taoqin Chen, Shanghai University, China

Prof. Svetlana Prokopchina, Moscow State University & Financial University of Government of Russian Federation, Russia

Dr. Muhamamd Asif Khan, Qatar University, Qatar

Time Schedule (Beijing Time, UTC/GMT+8)

November 17 (Online in ZOOM)

Keynote Session 1	
9:00-9:30	Reconfigurable Intelligent Surface Aided MIMO Communications: Challenges and Opportunities Xiaojun Yuan University of Electronic Science and Technology of China, China
Invited Session 1	
9:30-10:00	HealthGuard: Blockchain-Powered Healthcare Data Security Gabriel Gomes de Oliveira State University of Campinas, Brazil
10:00-10:30	Reconfigurable intelligent surface enabled future network Ruiqi (Richie) Liu Wireless Research Institute, ZTE Corporation, China
10:30-11:00	Towards Robust Foundation Model: Adversarial Contrastive Learning Jingfeng Zhang University of Auckland, New Zealand
11:00-11:30	Chengnian Long Shanghai Jiao Tong University, China
Keynote Session 2	
11:30-12:00	Changxu (Sean) Wu Tsinghua University, China
12:00-13:00	Lunch
Keynote Session 3	
13:00-13:30	Towards Extreme Band Communications Mohamed-Slim Alouini King Abdullah University of Science and Technology (KAUST), Saudi Arabia
Invited Session 2	
13:30-14:00	Real-Time Scene Recovery Tieyong Zeng The Chinese University of Hong Kong (CUHK), China
14:00-14:30	Brain-inspired Computing with Emerging Memristors: Opportunity and challenges Yishu Zhang Zhejiang University, China
Oral Session	
14:30-14:45	The Two Sides of AI in Cybersecurity: Opportunities and Challenges Mowafaq Salem Alzboon Jadara University, Jordan
14:45-15:00	Detection of asphalt roads degradation using Deep Learning applied to Unmanned Aerial Vehicle imagery Adama COULIBALY University Gaston Berger, Senegal
15:00-15:15	A Comprehensive Study on Model Initialization Techniques Ensuring Efficient Federated Learning Adwaita Janardhan Jadhav San Diego, USA

Time Schedule (Beijing Time, UTC/GMT+8)

November 18, Hilton Garden Inn Hangzhou Xixi Zijingang- Second floor garden Room

8:00-8:55	Registration in Desk
Opening Speech	
8:55-9:00	Prof. Gyu Myoung Lee Liverpool John Moores University (LJMU), UK
Keynote Session	
9:00-9:30	Near-Field Communications: What will be different? Yuanwei Liu Queen Mary University of London, UK
9:30-10:00	Parameter tuning-free matrix completion: A Bayesian approach Yik-Chung Wu The University of Hong Kong (HKU), China
Invited Session	
10:00-10:30	Advancing Point Cloud Processing: Novel Approaches to Upsampling, Completion, and Generation of 3D Data Xiaogang Wang LIGHTSPEED STUDIOS, Singapore
10:30-10:45	Photo&Break
Oral Session	
10:45-11:00	ONEWO: A Dataset of Anomaly and Object Detection for Community Surveillance Changyuan Zhou Onewo Space-Tech Service Co., Ltd., China
11:00-11:15	Shallow water equations-fused deep learning model ensembled with a subregion-specific sampling method for predicting flood dynamics Changli Li Central South University, China
11:15-11:30	Predictive computing of human errors while training machine learning models Hongjie Tao Zhejiang University of Finance and Economics, China
11:30-11:45	The Long-algorithm Based Variational Quantum Scheme for Pattern Matching Problem Lu Liu Beijing Normal University, China
11:45-12:00	A Uniform Ensemble Model for Multilingual Recommendation Systems Qinglun Wang Onewo Space-Tech Service Co., Ltd., China
12:00-13:00	Lunch
Keynote Session	
13:00-13:30	Machine-Learning-based Multiparameter Performance Monitoring for Optical Communications Channels Yang Yue Xi'an Jiaotong University, China
13:30-14:00	Crowd behavior analysis in video by using optical flow and CNN Academician Sergey V. Ablameyko Belarusian State University, Belarus
14:00-14:30	Machine Learning for Optimal Resource Allocation in Communications Networks Kin K. Leung Imperial College London, UK
14:30-14:45	Break
Oral Session	
14:45-15:00	Photonic Artificial Intelligence Issues Aleksandr Raikov Jinan Institute of Supercomputing Technology, China

15:00-15:15	An Intelligent Cognitive-Inspired Computing for Complain Speech Analysis and Classification Ruoxin Li Zhejiang University of Finance and Economics, China
15:15-15:30	Embedded Multi-Agent Systems Functionality for Home Energy Optimization in IoT Devices Kennedy Ehimwenma Wenzhou Kean University, China
15:30-15:45	A Production Suite for Failure Detectors Oliver-Gilles Marin NYU Shanghai, China
15:45-16:00	Best Paper Award

Keynote & Invited Speakers

November 17, 2023-Zoom



Xiaojun Yuan

University of Electronic Science and Technology of China, China

Bio: Xiaojun Yuan (Senior Member, IEEE) received the Ph.D. degree in electrical engineering from the City University of Hong Kong, Hong Kong, in 2009. From 2009 to 2011, he was a Research Fellow with the Department of Electronic Engineering, the City University of Hong Kong. He was also a Visiting Scholar with the Department of Electrical Engineering, the University of Hawaii at Manoa, Honolulu, HI, USA, in spring and summer 2009, and in the

same period of 2010. From 2011 to 2014, he was a Research Assistant Professor with the Institute of Network Coding, The Chinese University of Hong Kong. From 2014 to 2017, he was an Assistant Professor with the School of Information Science and Technology, ShanghaiTech University, Shanghai, China. He is currently a state-specially-recruited Professor with the University of Electronic Science and Technology of China, Chengdu, China. He has authored or coauthored more than 220 peer-reviewed research papers in the leading international journals and conferences in the related areas. His research interests include signal processing, machine learning, and wireless communications, including but not limited to intelligent communications, structured signal reconstruction, Bayesian approximate inference, and distributed learning. He was on several technical programs for international conferences. He was the Editor of IEEE leading journals, including IEEE Transactions on Wireless Communications and IEEE Transactions on Communications. He was the co-recipient of the Best Paper Award of IEEE International Conference on Communications (ICC) 2014, the Best Journal Paper Award of IEEE Technical Committee on Green Communications and Computing (TCGCC) 2017, and IEEE Heinrich Hertz Award for Best Communication Letter 2022.

Speech Title: Reconfigurable Intelligent Surface Aided MIMO Communications: Challenges and Opportunities

Speech Abstract: Reconfigurable intelligent surface (RIS) is regarded as one of the candidate technologies to enable next-generation wireless communications (6G). A RIS is made of a large number of low-cost reconfigurable elements, a.k.a. meta-atoms or unit cells, that are able to control how incident electromagnetic (EM) waves are reflected. The unit cells of a RIS can be designed to cooperatively achieve specific purposes, such as scattering the impinging waves, absorbing the impinging waves, and focusing the reflected wave to certain directions. In this talk, we introduce the channel modeling, optimization, and capacity analysis of RIS-assisted MIMO systems. First of all, we propose a partition-based passive beamforming method to reduce the number of variables to be optimized, thereby reducing computational overhead. Then, we propose a near-field RIS-assisted MIMO channel model based on the spherical-wave assumption. Based on the established channel model, we study the spatial multiplexing capability of the cascaded line-of-sight MIMO channel, and analyze the capacity of the system by jointly optimizing the active and passive beamforming, and the transceiver array orientations.



Gabriel Gomes de Oliveira

University of Campinas (UNICAMP), Brazil

Bio: He is currently a Researcher at the State University of Campinas (UNICAMP). Develops research projects related to: Artificial Intelligence (AI), Big Data, Intelligent Information Systems (IIS), Internet of Things (IoT), Intelligent Transportation Systems (ITS), Smart Cities, and Sensors. Reviewer of several Congresses and Journals, such as, (ACM, Elsevier, SAGE, Hindawi, IEEE, IET, Taylor Francis, Springer, and Wiley, among others) of national scope

and mainly international, with more than 1200 Revisions, recognized by Publons or with Certificates

issued. In addition to numerous publications in Conferences (ACM, IEEE, and Springer), and High Impact Factor Journals. YP Chair IEEE Sensor and Systems Joint Council South Brazil (2022 to date). Finally, Editor of Special Series of Scientific Journals, Editor of Springer Nature, (Smart Innovation, Systems, and Technologies), and IOP Publisher Invited to join as Associate Editor of Journals: IET Circuits, Devices & Systems and IET Wireless Sensor Systems (2022 -2025). And Academic Editor of the Journal PLOS ONE.

Speech Title: HealthGuard: Blockchain-Powered Healthcare Data Security

Speech Abstract: Healthcare information is sensitive and private. Consequently, users must ensure that their medical data is treated confidentially, securely, and privately. Medical data is easily stolen, altered, or even deleted entirely. If the situation happens, medical data cannot be logged or retrieved reliably, which delays treatment progress and even endangers the patient's life. Conventional methods of medical data storage led to threats of data by attackers. Significantly, medical applications face security problems like data stealing. The Blockchain overcomes the security issue in medical applications, since its features, such as decentralization, cryptography-based security, immutability, and consensus algorithms, store medical data in a secure way called blocks and shared keys. This work highlights the decentralized medical data storage on different blockchain networks and its performance.



Ruiqi (Richie) Liu

Wireless Research Institute, ZTE Corporation, China

Bio: Ruiqi (Richie) Liu (S'14-M'20) received the B.S. and M.S. degree (with honors) in electronic engineering from the Department of Electronic Engineering, Tsinghua University in 2016 and 2019 respectively. He is now a master researcher in the wireless and computing research institute of ZTE Corporation, responsible for long-term research as well as standardization. His main research interests include reconfigurable intelligent surfaces, integrated sensing and communication and wireless positioning. He is the author or co-author of several books and book chapters. He has participated in national key research projects as the researcher or research lead. During his 3-year service at 3GPP from 2019 to 2022, he has authored and submitted more than 500 technical documents with over 100 of them approved, and he served as the co-rapporteur of the work item (WI) on NR RRM enhancement and the feature lead of multiple features. He currently serves as the Vice Chair of ISG RIS in the ETSI. He actively participates in organizing committees, technical sessions, tutorials, workshops, symposia and industry panels in IEEE conferences as the chair, organizer, moderator, panelist or invited speaker. He served as the guest editor for Digital Signal Processing and the lead guest editor for the special issue on 6G in IEEE OJCOMS. He serves as the Deputy Editor-in-Chief of IET Quantum Communication and the Editor of ITU Journal of Future and Evolving Technologies (ITU J-FET). He is the Standardization Officer for IEEE ComSoc ETI on reconfigurable intelligent surfaces (ETI-RIS) and the Standards Liaison Officer for IEEE ComSoc Signal Processing and Computing for Communications Technical Committee (SPCC-TC). His recent awards include the 2022 SPCC-TC Outstanding Service Award and the Beijing Science and Technology Invention Award (Second Prize, 2022).

Speech Title: Reconfigurable intelligent surface enabled future network

Speech Abstract: Recently, reconfigurable intelligent surfaces (RISs) are considered as a strong candidate for next generation wireless technologies, thanks to its advantage of being able to configure the wireless propagation environment in a cost-effective and energy-efficient way. Many literature study the theoretical aspects of RIS-assisted communication while prototyping and field trials are only starting to appear. A key step towards the standardization and commercialization of RISs is to complete comprehensive field trials in cellular networks, such as the 5th generation (5G) network. There are several typical deployment scenarios in 5G networks such as indoors, outdoors and mixed indoors and outdoors, where RISs can provide coverage to weak reception areas, enhance transmission robustness, fix coverage holes and increase the maximum available data

rate. In this talk, a variety types of RIS prototypes are fabricated and tested with off-the-shelf 5G user equipments (UEs) in 5G networks to validate the performance gain introduced by RISs to typical deployment scenarios of 5G at different working frequencies. Some system-level simulations are also conducted for several typical scenarios to be used as a baseline to compare to the trial results, where all parameters are selected according to 5G standards. The experimental results confirm the feasibility and effectiveness of RISs to solve coverage issues and improve received signal qualities in 5G networks across different frequency ranges. The potential standardization roadmap and future plans for RIS to become a vital component of 5G-Adv and 6G networks are also given.



Jingfeng Zhang

University of Auckland, New Zealand

Bio: Jingfeng Zhang is tenured assistant professor at the University of Auckland, and also a scientist at the “Imperfect Information Learning Team” in RIKEN-AIP. He serves as guest lecturer at the University of Tokyo in 2022-2023 and serves as main lecturer at the University of Auckland, giving machine learning related courses.

He serves as an associate editor for IEEE Transactions on Artificial Intelligence. He is a long-standing reviewer for prestigious ML conferences such as ICLR, ICML, NeurIPS, etc. His long-term research interest is to build a secure and responsible ML environment.

Jingfeng is now PhD Accredited Supervisor at the University of Auckland, and actively seeking motivated individuals who are willing to pursue a PhD degree under Jingfeng's supervision. Jingfeng is now interested in robust foundation models.

He obtained his Ph.D. degree at the School of Computing at the National University of Singapore. He was the PI of multiple grants, including “JST Strategic Basic Research Programs, ACT-X, FY2021-2023”, “JSPS Grants-in-Aid for Scientific Research (KAKENHI), Early-Career Scientists, FY2022-2023”, “RIKEN-Kyushu Univ Science & Technology Hub Collaborative Research Program, FY2022”, and was a recipient of the RIKEN Ohbu Award 2021 (50 recipients each year in all RIKEN's disciplines).

Speech Title: Towards Robust Foundation Model: Adversarial Contrastive Learning

Speech Abstract: Foundation models (e.g., Generated Pretrained Transformer (GPT), Stable Diffusion, CLIP, etc.) trained on the unlabeled data at scale that can be then adapted to a wide range of downstream tasks. However, on deployment in critical applications, foundation model are vulnerable to adversarial perturbations that negatively affect all downstream applications. Therefore, we need to develop robust foundation models. To this end, we study adversarial contrastive learning (ACL) that is fundamental machine learning algorithm to build robust foundation models.

First, we constructed a causal theoretical framework to formulate the ACL, which inspires to design a superior algorithm that achieves a new state-of-the-art robustness transferability. Furthermore, we built the RobustSSL benchmark <https://robustssl.github.io> that can objectively and comprehensively compare all existing ACL algorithms.

Second, we built an efficient ACL via Robustness-Aware Coreset Selection (RCS). We translate the RCS problem to (weak) submodular set optimization problem with cardinality constraint, in which the greed search is efficient and can also guarantee the optimality to some extent. In particular, with the RCS, we are the first to apply ACL on large-scale ImageNet dataset. Thus, we prove the concept of possibility of applying ACL on large-scale foundation models.

Chengnian Long



Shanghai Jiao Tong University, China

Bio: Chengnian Long is a tenured professor of Department of Automation, School of Electronic Information and Electrical Engineering, Shanghai Jiao Tong University. He is Deputy Director at Blockchain Research Center, Shanghai Jiao Tong University and adjunct professor at Intelligent Connected Electric Vehicle Innovation Center, Shanghai Jiao Tong University. His research interest mainly focuses on the Intelligent Connected Systems(ICS), including Artificial Intelligence of Things (AIoT), Blockchain, and Distributed Autonomous System. He was the Editor of IEEE Transactions on Intelligent Transportation Systems, IEEE Blockchain Technical Briefs and IET Blockchain. He is a senior member of the IEEE.

Speech Title: Blockchain-based Privacy-Preserving and Publicly Verifiable Computation Method



Chengnian Long

Shanghai Jiao Tong University, China

Bio: Dr. Wu graduated from the Department of Industrial and Operations Engineering at the University of Michigan Ann Arbor in 2007. After graduation, he worked as an assistant professor, associate professor, and tenured full professor at the State University of New York and the University of Arizona in the United States. In 2020, he was selected to return to China as a full-time tenured full professor at Tsinghua University. Dr. Wu's research integrates cognitive science and engineering systems design, and is committed to modeling human cognitive systems and their applications in system design, improving the safety and efficiency of human-computer systems, promoting human performance in human-computer interaction and optimizing human workload. Dr. Wu has published 133 papers in the field of human factors engineering, including 95 journal papers, 36 conference papers, 2 English monograph chapters, and a number of intelligent system design patents. IEEE Transactions on Intelligent Transportation Systems, MAN, and Cybernetics, IEEE Transactions on Intelligent Transportation Systems, Psychological Review (Impact Factor: 9.02), ACM Transactions on Computer-Human Interaction, and several other journals. He has served as Chair of the Human Performance Modeling Technology Group of the International Society for Human Factors Engineering (HFES). He is also an associate editor of four international SCI journals: IEEE Transactions on Human Machine Systems, IEEE Transactions on Intelligent Transportation Systems (IEEE Intelligent Transportation Systems), Human Factors and Ergonomics in Manufacturing & Service Industries, Behaviour & Information Technology. In 2015, he received the Senior Fellow of the Year Award from the Dean of the School of Engineering and Applied Sciences at the State University of New York at Buffalo. Dr. Wu trained students to work in Pennsylvania State University and other famous universities, as well as the United States General Motors, General Electric, Lenovo and other major enterprises.



Mohamed-Slim Alouini

King Abdullah University of Science and Technology (KAUST), Saudi Arabia

Bio: Mohamed-Slim Alouini was born in Tunis, Tunisia. He received the Ph.D. degree in Electrical Engineering from the California Institute of Technology (Caltech) in 1998. He served as a faculty member at the University of Minnesota then in the Texas A&M University at Qatar before joining in 2009 the King Abdullah University of Science and Technology (KAUST) where he is now a Distinguished Professor of Electrical and Computer Engineering. Prof. Alouini is a Fellow of the IEEE and OPTICA (Formerly the Optical Society of America (OSA)). He is currently particularly interested in addressing the technical challenges associated with the uneven distribution, access to, and use of information and communication technologies in rural, low-income, disaster, and/or hard-to-reach areas.

Speech Title: Towards Extreme Band Communications

Speech Abstract: A rapid increase in the use of wireless services over the last few decades has led to the problem of radio-frequency (RF) spectrum exhaustion. More specifically, due to this RF spectrum scarcity, additional RF bandwidth allocation, as utilized in the recent past over "traditional bands", is not anymore enough to fulfill the demand for more wireless applications and higher data rates. The talk goes first over the potential offered by extreme band communication (XB-Com) systems to relieve spectrum scarcity. Indeed, mm-wave, THz, and free space optics broadband wireless systems recently attracted several research interests worldwide due to the progress in electronics and photonics technologies. By utilizing these extreme frequency bands and employing extreme large bandwidths, the 6G target data rates over 100 Gbps could be achieved. The talk then summarizes some of the challenges that need to be surpassed before such kinds of systems can be deployed. For instance, it explains how the THz transmission band has immunity against the fog compared with the optical one, while being affected by the rain as it is the case for the mm-wave band. In addition, the role of ultra-massive multiple-input multiple-output (UM-MIMO) systems and reconfigurable intelligent surfaces in overcoming the distance problem at very high frequencies will be discussed. Finally, the talk offers an overview of some recent studies illustrating how these different XB-Com technologies can collaborate to increase emerging and future networks' reliability and coverage while maintaining their high capacity.



Tiejong Zeng

The Chinese University of Hong Kong (CUHK), Hong Kong, China

Bio: Dr. Tiejong Zeng is a Professor at the Department of Mathematics, The Chinese University of Hong Kong (CUHK). Together with colleagues, he has founded the Center for Mathematical Artificial Intelligence (CMAI) since 2020 and served as the director of CMAI. He received the B.S. degree from Peking University, Beijing, China, the M.S. degree from Ecole Polytechnique, Palaiseau, France, and the Ph.D. degree from the University of Paris XIII, Paris, France, in

2000, 2004, and 2007, respectively. His research interests include image processing, optimization, artificial intelligence, scientific computing, computer vision, machine learning, and inverse problems. He has published around 100 papers in the prestigious journals such as SIAM Journal on Imaging Sciences, SIAM Journal on Scientific Computing, Journal of Scientific Computing, IEEE Transactions on Pattern Analysis and Machine Intelligence (TPAMI), International Journal of Computer Vision (IJCV), IEEE Transactions on Neural Networks and Learning

Systems (TNNLS), IEEE Transactions on Image Processing (TIP), IEEE Medical Imaging (TMI), and Pattern Recognition. He is laureate of the 2021 Hong Kong Mathematical Society (HKMS) Young Scholars Award, due to the significant contributions in mathematical imaging and data science

Speech Title: Real-Time Scene Recovery

Speech Abstract: Scene recovery is a fundamental imaging task with several practical applications, including video surveillance and autonomous vehicles, etc. In this talk, we provide a new real-time scene recovery framework to restore degraded images under different weather/imaging conditions, such as underwater, sand dust and haze. A degraded image can actually be seen as a superimposition of a clear image with the same color imaging environment (underwater, sand or haze, etc.). Mathematically, we can introduce a rank-one matrix to characterize this phenomenon, i.e., rank-one prior (ROP). Using the prior, a direct method with the complexity $O(N)$ is derived for real-time recovery. For general cases, we develop ROP + to further improve the recovery performance. Comprehensive experiments of the scene recovery illustrate that our method outperforms competitively several state-of-the-art imaging methods in terms of efficiency and robustness.



Yishu Zhang

Zhejiang University, China

Bio: Dr. Yishu Zhang is a researcher of the Science and Technology Hundred Talents Program of the School of Micro-Nano Electronics, Zhejiang University. He graduated from Jilin University with a bachelor's degree in Microelectronics in 2014. In 2019, he received a doctorate in engineering from the Singapore University of Technology and Design, and later served as a postdoctoral researcher at the National University of Singapore. During his Ph.D. study, he was engaged in neuromorphic computing research at Sungkyunkwan University in South Korea and the Institute of Information and Communications in Singapore. The main research directions include the design and development of brain-inspired smart chips based on new memristive devices and biocompatible biological smart electronic chips. During his doctoral period, he designed and developed biologically similar ultra-low power artificial neurons and synaptic devices, laying a solid foundation for the realization of large-scale artificial intelligence chips. Relevant results have been published in top international academic journals such as Nature Communications, Nano Letters, Small and Applied Physics Letters. In the Singapore Industrial Symposium, the research results have won several poster awards from internationally renowned semiconductor companies such as AMD, MediaTek and STMicroelectronics. In addition, he won the 2019 National Scholarship for Outstanding Self-Financed International Students.

Speech Title: Brain-inspired Computing with Emerging Memristors: Opportunity and challenges

Speech Abstract: As Moore's law approaching the end, neuromorphic computation – brain inspired computation - has emerged as one of the most promising technologies to continue the advancement of computing systems as it shows great potentials of improving the computational efficiency over conventional von-Neumann based computing paradigms in terms of energy efficiency and cognitive capability, such as learning and decision making. Aiming at overcoming the fundamental issue of von Neumann bottleneck and realization of human-level intelligence ultimately, neuromorphic systems try to implement large-scale artificial neural network (ANN) on hardware by emulating of the functions of biological neurons and synapses –the basic building blocks of nervous system. To this end, developing highly scalable and energy-efficient artificial neurons and synapses with bio-plausible functions is critical but remains great challenges. However, conventional complementary metal-oxide-semiconductor (CMOS) devices with binary states and complicated auxiliary circuits, cannot accommodate such requirements due to energy and areal inefficiencies. The recent advances in memristive nano-devices has opened up new avenues for implementing large-scale full memristive neural networks (FMNN) comprising memristive neurons and synapses because of unique analogue properties.

Keynote & Invited Speakers

November 17, 2023-Hangzhou



Yuanwei Liu

Queen Mary University of London, London, UK

Bio: Yuanwei Liu is an Associate Professor with the School of Electronic Engineering and Computer Science, Queen Mary University of London. His research interests include next generation multiple access, integrated sensing and communications reconfigurable intelligent surface, and near-field communications. His research attract over 20,000 Google Scholar citations. He is listed as one of 35 Innovators Under 35 China in 2022 by MIT Technology

Review and a Web of Science Highly Cited Researcher since 2021. He serves as an IEEE Communication Society Distinguished Lecturer, an IEEE Vehicular Technology Society Distinguished Lecturer, the academic Chair for the Next Generation Multiple Access Emerging Technology Initiative, the rapporteur of ETSI Industry Specification Group on Reconfigurable Intelligent Surfaces, and the UK representative for the URSI Commission C on Radio communication Systems and Signal Processing. He received IEEE ComSoc Outstanding Young Researcher Award for EMEA in 2020. He received the 2020 IEEE Signal Processing and Computing for Communications (SPCC) Technical Committee Early Achievement Award, IEEE Communication Theory Technical Committee (CTTC) 2021 Early Achievement Award. He received IEEE ComSoc Outstanding Nominee for Best Young Professionals Award in 2021. He is the co-recipient of the Best Student Paper Award in IEEE VTC2022-Fall, the Best Paper Award in ISWCS 2022, the 2022 IEEE SPCC-TC Best Paper Award and the IEEE ICCT 2023 Best Paper Award. He serves as the Co-Editor-in-Chief of IEEE ComSoc TC Newsletter, an Area Editor of IEEE Communications Letters, an Editor of IEEE Communications Surveys & Tutorials, IEEE Transactions on Wireless Communications, IEEE Transactions on Vehicular Technology, and IEEE Transactions on Network Science and Engineering. He serves as the (leading) Guest Editors for Proceedings of the IEEE/IEEE JSAC/JSTSP/Network/TGCN.

Speech Title: Near-Field Communications: What Will Be Different?

Speech Abstract: In this talk, the design dilemma of "What will be different between near-field communications (NFC) and far-field communications (FFC)? " is discussed from four perspectives. (1) From the channel modelling perspective, the differences between near-field and far-field channel models are discussed. (2) From the performance analysis perspective, analytical results for characterizing the degrees of freedom and the power scaling laws in the near-field region are provided. (3) From the beamforming perspective, the features of far-field beamsteering and near-field beamfocusing are compared. A couple of new beamforming structures for NFC are also introduced. (4) From the application perspective, several new designs are discussed in the context of promising next-generation technologies in NFC. Finally, research opportunities and problem are discussed.



Yik-Chung Wu

The University of Hong Kong (HKU), China

Bio: Yik-Chung Wu received the B.Eng. (EEE) degree in 1998 and the M.Phil. degree in 2001 from the University of Hong Kong (HKU). He received the Croucher Foundation scholarship in 2002 to study Ph.D. degree at Texas A&M University, College Station, and graduated in 2005. From August 2005 to August 2006, he was with the Thomson Corporate Research, Princeton, NJ, as a Member of Technical Staff. Since September 2006, he has been with HKU,

currently as an Associate Professor. He was a visiting scholar at Princeton University, in summers of 2015 and 2017. His research interests are in general areas of signal processing and communication

systems, and in particular Bayesian inference, distributed algorithms, and large-scale optimization. Dr. Wu served as an Editor for IEEE Communications Letters, and IEEE Transactions on Communications. He is currently a Senior Area Editor for IEEE Transactions on Signal Processing, an Associate Editor for IEEE Wireless Communications Letters, and an Editor for Journal of Communications and Networks. He was a TPC member for over 100 IEEE major conferences. He received four best paper awards in international conferences, with the most recent one from IEEE International Conference on Communications (ICC) 2020. He is a senior member of the IEEE.

Speech Title: Parameter tuning-free matrix completion: A Bayesian approach

Speech Abstract: Matrix completion is an important data analytic tool in many applications, such as recommendation systems and image completion. Traditionally, matrix completion is approached from optimization perspective. While proven to be effective, optimization-based matrix completion usually involve hyperparameters tuning, with one of the major hyperparameters being the matrix rank. However, when the number of hyperparameters is more than 3 or 4, tuning them becomes computationally expensive. This talk approaches the problem from the Bayesian perspective and shows how hyperparameter tuning can be eliminated while providing comparable or even better performance than corresponding optimization-based algorithms.



Xiaogang Wang

LIGHTSPEED STUDIOS, Singapore

Bio: Xiaogang Wang is a senior researcher in LIGHTSPEED STUDIOS, Singapore, where he focuses on applying computer vision techniques to design and generate 3D scenes. Before that, he was a senior engineer at Motional, Singapore, where he conducts BEV perceptions and HD map generation. Before joining Motional, he was a research fellow at National University of Singapore (NUS) from Oct. 2020 to Sep. 2021. Prior to that, he did his PhD in

NUS from Aug. 2016 to Aug. 2020. He has published several top journals and conference papers, including IEEE TPAMI, CVPR, ICCV, etc. His research focuses on deep learning and computer vision, especially for 3D generation and reconstruction. He also serves as a reviewer for TPAMI, TNNLS, TVCG, TIP, RA-L, ICCV, ECCV, CVPR, IROS and ICRA.

Speech Title: Advancing Point Cloud Processing: Novel Approaches to Upsampling, Completion, and Generation of 3D Data

Speech Abstract: Point clouds is a fundamental representation of 3D objects, playing a crucial role in various applications such as computer vision, robotics, and computer graphics. This presentation shows advanced techniques for point cloud upsampling, completion, and generation, aiming to enhance the quality of point cloud data. The proposed methods leverage deep learning and novel network architectures to achieve SOTA performance in point cloud processing tasks. For upsampling, we introduce a technique that increases the density of point clouds while preserving the underlying geometric structure with evenly distributed points. In the completion task, we present methods that effectively reconstructs missing or occluded regions in the point cloud data, resulting in a more complete and accurate representation of the 3D object. Finally, for point cloud generation, we explore generative models that synthesize novel point clouds, enabling the exploration of new 3D object shapes and structures. Our experimental results demonstrate the effectiveness of these approaches and contribute to the advancement of point cloud processing and analysis.



Yang Yue

Xi'an Jiaotong University, China

Bio: Yang Yue received the B.S. and M.S. degrees in electrical engineering and optics from Nankai University, China, in 2004 and 2007, respectively. He received the Ph.D. degree in electrical engineering from the University of Southern California, USA, in 2012. He is a Professor with the School of Information and Communications Engineering, Xi'an Jiaotong University, China. Dr. Yue's current research interest is intelligent photonics, including optical communications, optical perception, and optical chip. He has published over 260 journal papers (including Science) and conference proceedings with >10,000 citations, six edited books, two book chapters, >60 issued or pending patents, >200 invited presentations (including 1 tutorial, >30 plenary and >50 keynote talks). Dr. Yue is a Fellow of SPIE, a Senior Member of IEEE and Optica. He is an Associate Editor for IEEE Access and Frontiers in Physics, Editor Board Member for four other scientific journals, Guest Editor for >10 journal special issues. He also served as Chair or Committee Member for >100 international conferences, Reviewer for >70 prestigious journals.

Speech Title: Machine-Learning-based Multiparameter Performance Monitoring for Optical Communications Channels

Speech Abstract: In recent years, machine learning has come to the forefront as a promising technology to aid in multiparameter performance monitoring for optical communications channels. In this talk, we will introduce CNN-based techniques to effectively monitor multiple system performance parameters of optical channels using eye diagram measurements. Experimental results demonstrate this method achieves a prediction accuracy >98% when tasked with identifying the modulation format (QPSK, 8-QAM, or 16-QAM), as well as the optical signal-to-noise ratio (OSNR), roll-off factor (ROF), and timing skew for 32 GBd coherent channels. For PAM-based intensity-modulation direct detection (IMDD) channel eye-diagram-based CNN method maintain >97% identification accuracy for 432 classes under different combinations of probabilistic shaping (PS), ROF, baud rate, OSNR, and chromatic dispersion (CD) by each modulation format. Furthermore, we undertake on an extensive comparison of ResNet-18, MobileNetV3 and EfficientNetV2. Our designed VGG-based model of reduced layers, alongside the lightweight MobileNetV3, demonstrates enhanced cost-effectiveness while maintaining high accuracy.



Academician Sergey V. Ablameyko

Belarusian State University, Belarus

Bio: Sergey Ablameyko (born in 1956, DipMath in 1978, PhD in 1984, DSc in 1990, Prof in 1992). He was a Rector (President) of the Belarusian State University (2008-2017) and now he is a Professor of BSU.

He has more than 650 publications including 25 authored/co-authored books and 25 edited books. In his academic career he was a visiting scientist in Italy, Japan, Sweden, Finland, England, Germany, UK, Greece, Spain, Australia, New Zealand, China. He was a chair/co-chair, member of Program Committees of numerous international conferences. He is in Editorial board of many international journals. His scientific interests are: artificial intelligence, computer vision, knowledge-based systems, geographical information systems, medical imaging. He is an Academician of the National Academy of Sciences of Belarus, Academician of Belarusian Academy of Engineering, Academician of Academy of Europe, Academician of Spanish Royal Academy of Doctors, Academician of European Academy of Economy and Enterprise Management, Academician of Russian Academy of Natural Sciences and Russian Space Academy, Academician of Spanish Royal Academy of Economics and Finance, Honorary professor of universities in China, Russia, Vietnam, Serbia, Belarus. He is a Fellow and Vice-President of Asia-Pacific Artificial Intelligence Association, Fellow of International Association for Pattern Recognition, Fellow of IEE (1995). For his activity he was awarded by State Prize of Belarus (highest

national scientific award), Friendship Award of Russian Federation, Friendship Award of Zhejiang Province of China and many other national and international awards.

Speech Title: Crowd behavior analysis in video by using optical flow and CNN

Speech Abstract: Crowd behavior analysis is an important task in many applications. In this talk, a new approach for crowd behavior analysis in video by combining CNN and integral optical flow is described. At first, definitions of crowd motion are given, along with motion parameters that can be used to perform crowd analysis. Secondly, crowd motion features and parameters are defined. Thirdly, an algorithm of crowd behavior analysis using CNN and integral optical flow is proposed. Experimental results show that, with the help of CNN, optical flow can be calculated more accurately and quickly, and by using integral optical flow, the algorithm demonstrates stronger robustness to noise and the ability to get more accurate results of moving objects.



Kin K. Leung

Imperial College, London

Bio: Kin K. Leung received his B.S. degree from the Chinese University of Hong Kong, and his M.S. and Ph.D. degrees from University of California, Los Angeles. He joined AT&T Bell Labs in New Jersey in 1986 and worked at its successor companies until 2004. Since then, he has been the Tanaka Chair Professor in the Electrical and Electronic Engineering (EEE), and Computing Departments at Imperial College in London. He serves as the Head of Communications and

Signal Processing Group in the EEE Department at Imperial. His current research focuses on optimization and machine-learning techniques for system design and control of large-scale communications, computer and sensor networks. He also works on multi-antenna and cross-layer designs for wireless networks.

He is a Fellow of the Royal Academy of Engineering (2022), IEEE Fellow (2001), IET Fellow (2022), and member of Academia Europaea (2012). He received the Distinguished Member of Technical Staff Award from AT&T Bell Labs (1994) and the Royal Society Wolfson Research Merits Award (2004-09). Jointly with his collaborators, he received the IEEE Communications Society (ComSoc) Leonard G. Abraham Prize (2021), the IEEE ComSoc Best Survey Paper Award (2022), the U.S.-UK Science and Technology Stocktake Award (2021), the Lanchester Prize Honorable Mention Award (1997), and several best conference paper awards. He currently serves as the IEEE ComSoc Distinguished Lecturer (2022-23). He was a member (2009-11) and the chairman (2012-15) of the IEEE Fellow Evaluation Committee for the ComSoc. He has served as guest editor and editor for 10 IEEE and ACM journals and chaired the Steering Committee for the IEEE Transactions on Mobile Computing. Currently, he is an editor for the ACM Computing Survey and International Journal on Sensor Networks.

international awards.

Speech Title: Machine Learning for Optimal Resource Allocation in Communications Networks

Speech Abstract: Optimization techniques are widely used to allocate and share limited resources to competing demands in communication networks. The speaker will start by showing the well-known Transport Control Protocol (TCP) on the Internet as a distributed solution to achieve the optimal allocation of network bandwidth. Unfortunately, factors such as multiple grades of service quality, variable transmission power, and tradeoffs between communication and computation often make the optimization problem for resource allocation non-convex. New distributed solution techniques are needed to solve these problems.

Gradient-based iterative algorithms are commonly used to solve these optimization problems. Much research focuses on improving the iteration convergence. However, when the system parameters change, it requires a new solution from the iterative methods. The speaker will present a new machine-learning method by using two Coupled Long Short-Term Memory (CLSTM) networks to quickly and robustly produce the optimal or near-optimal solutions to constrained optimization

problems over a range of system parameters. Numerical examples for allocation of network resources will be presented to confirm the validity of the proposed method.

Oral Presentations

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Changyuan Zhou
Onewo Space-Tech Service Co., Ltd. , China

Title: ONEWO: A Dataset of Anomaly and Object Detection for Community Surveillance

Abstract:

In the era of smart cities, the role of surveillance systems in ensuring community safety and environmental sustainability has become increasingly significant. Traditional surveillance methods, reliant on human monitoring, often exhibit deficiencies in terms of speed, accuracy, and scalability. However, to the best of our knowledge, there is no related dataset on this research field. This paper introduces a novel approach to address these challenges, leveraging the power of computer vision technology to enhance surveillance capabilities. To bridge the gap between algorithms research and application, in this paper, we propose the task and dataset, and highlight the necessity of camera grading. ONEWO comprises 18,307 images from 2,863 cameras, which covers 20 main objects of interest for city management, providing annotation of bounding boxes and segmentation masks of 121,342 instances. Experiments demonstrate that our best baseline model achieves mAP 50 of 77.5 for the entire test set. This work aims at contributing to the development of more efficient, accurate, and scalable surveillance systems, thereby promoting community safety and environmental sustainability in smart cities.

77

Changli Li
Central South University, China

Title: Shallow water equations-fused deep learning model ensembled with a subregion-specific sampling method for predicting flood dynamics

Abstract:

The computational prediction of flood dynamics is a long-standing problem in hydrodynamics and hydrology. Until now, conventional numerical models based on shallow water equations (SWEs) have been the dominant approaches. Here, we propose a deep learning model using a physics-informed neural network (PINN) embedded in SWEs. Training data are reconstructed from prior-known partial numerical solutions and a novel subregion-specific sampling method that adapts well to the violent variations in flood surfaces. Various traditional cases of 2D dam-break floods are used to illustrate and validate the effectiveness of the proposed model. The results show that the proposed SWEs-embedded model predicts the dam-break flood dynamics well, and outperforms the pure data-driven multilayer perceptron (MLP) model and a similar model with the random resampling method. We also demonstrate that the PINN-embedded model improves the computational efficiency by over 3~4 orders of magnitude compared to the traditional 2D numerical solution of SWEs. Our study showcases how numerical simulation and deep learning techniques can be coupled to investigate the details of dam-break floods.

101

Hongjie Tao
Zhejiang University of Finance and Economics, China

Title: Predictive computing of human errors while training machine learning models

Abstract:

Due to the world's interwoven information and the limited recognition of human beings, the training of machine learning models may cause uncertainties. Looking for the regularity of uncertain concepts is truly an issue that needs to be addressed. This study aims to investigate the human error modes and probabilities through training the machine learning model, especially for image pattern recognition under human-computer computing scenarios. The results showed that machine learning for image pattern recognition lacks reliability while training the models, and the professionalism of operators and the number of iterations are important to guarantee the system reliability.

87

Lu Liu
Beijing Normal University, China

Title: The Long-algorithm Based Variational Quantum Scheme for Pattern Matching Problem

Abstract:

Grover algorithm is a popular model in quantum computation field and has the advantage of outperforming its classical counterpart in terms of searching speed, hence it has been applied in various domains such as pattern matching. Unfortunately, there are two central issues for this quantum search algorithm, i.e., Grover algorithm, in practical application that firstly it can only achieve a probability nearing 100% rather than exactly, secondly it tends to require a deep quantum circuit. In this work, we propose a Long-algorithm based quantum scheme for pattern matching problem, which can effectively enhance the success probability of quantum pattern matching and mitigate the needs for quantum computing resources. The performance of this scheme is demonstrated numerically, validating our design.

74

Qinglun Wang
Onewo Space-Tech Service Co., Ltd., China

Title: A Uniform Ensemble Model for Multilingual Recommendation Systems

Abstract:

Incomplete or missing user profiles can disrupt the effectiveness of recommender systems. Therefore, it is vital to establish a uniform ensemble model, which tends to recognize diverse customer shopping intentions. This paper presents our recall models consisting of traditional recommendation algorithms (i.e. itemCF, userCF, swing, etc.), deep graph recommendation algorithms (LightGCN), and embedding recommendations (word2vec embedding, cross encoder). This model is verified via multilingual shopping session datasets, namely Amazon-M2. Within KDD CUP 2023 Tasks 1 and 2, we use the sample data processing and model framework by low-cost devices. On the final leaderboard, the Onewo team is in 19th in Task1 and 21st in Task2. Every strategy is applied to match the top 100 items. Furthermore, we adopt a combination of group and 3 LGB models to re-rank recalled items for every strategy. By strategies, the Mean Reciprocal Rank (MRR) scores for tasks 1 and 2 of phase 2 are 0.33347 and 0.35541 respectively.

93

Aleksandr Raikov
Jinan Institute of Supercomputing Technology, China

Title: Photonic Artificial Intelligence Issues

Abstract:

This paper addresses the methodological issues of developing a Photonic Artificial Intelligence (PAI) based on full optical technologies for processing continuous (analogue) signals without transforming them into digital form. PAI must ensure overcoming digital computer limits. It can provide low-energy artificial intelligence (AI) and eliminate machine learning time. The analogue photonic way also will help to consider the non-formalisable cognitive semantics of AI models for more representing human feelings, thoughts, and the transcendental states of mind, which digital

computers cannot fully express. New problems are emerging in PAI, including new methods for parallel processing analogue signals, synthesising unique photonic materials for rewritable 3D holographic memory and controlling optical processes with digital computers. The paper suggests a genetic algorithm for synthesising the photonic materials using an inverse-problem-solving approach. This algorithm may also be used to solve computer fluid dynamic tasks quickly.

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Ruoxin Li
Zhejiang University of Finance and Economics, China

Title: Image inpainting Method Based Sparse Analysis Model Of Synchronous Dictionary Learning

Abstract:

This study trained and tested 1006 words using an LSTM network and a SOC model. The model achieved 90% accuracy and yielded relatively successful SOC corpus and SNA results. The computer model was also integrated into speech act theory by combining linguistics, computer science, and psychology. A large number of complaint languages were analyzed. This study demonstrates the feasibility of computer modeling and SOC in cognitive computing, showing their promising applications.

103

Kennedy Ehimwenma
Wenzhou Kean University, China

Title: Embedded Multi-Agent Systems Functionality for Home Energy Optimization in IoT Devices

Abstract:

The internet of things (IoT) is a connected networks of intelligent objects which includes home appliances, factory equipment, office systems and industrial machines. Using parameter modelling, this paper proposes a multi-agent system based enabled IoT home appliances. Just like wireless computers and printers are connected to the internet; this model presents autonomous agent-based home appliances for configuration for the IoT. As an intelligent agent-based device in the paradigm of multi-agent systems; each appliance can identify its IP (internet protocol) address, process the quantity and cost of energy consumed, and then share and communicate the data to the IoT for home users informed decision making. The model which optimizes the cost of energy in every home also denotes energy consumption monitoring, reduce energy waste and realization of low emission.

GN210

Oliver-Gilles Marin
NYU Shanghai, China

Title: A Production Suite for Failure Detectors

Abstract:

Designing a failure detection algorithm, implementing it, and assessing its performance is extremely complex. The behavior of a failure detector (FD) implementation varies with the evolving conditions of the network, and its initial parameter settings also have a huge impact. In this paper, we introduce a novel production platform as a means of systematizing the design and performance assessment of FDs. It provides a language dedicated to the definition of FDs and uses pre-acquired real-world traces to emulate network conditions. Our platform simplifies and accelerates the design and testing of new FDs, and allows to compare their respective strengths in multiple environments.

Poster Presentations

GN207

Title: Empirical Evaluation of ChatGPT on Requirements Information Retrieval Under Zero-Shot Setting

Abstract: Recently, various illustrative examples have shown the impressive ability of generative large language models (LLMs) to perform NLP related tasks. ChatGPT undoubtedly is the most representative model. We empirically evaluate ChatGPT's performance on requirements information retrieval (IR) tasks to derive insights into designing or developing more effective requirements retrieval methods or tools based on generative LLMs. We design an evaluation framework considering four different combinations of two popular IR tasks and two common artifact types. Under zero-shot setting, evaluation results reveal ChatGPT's promising ability to retrieve requirements relevant information (high recall) and limited ability to retrieve more specific requirements information (low precision). Our evaluation of ChatGPT on requirements IR under zero-shot setting provides preliminary evidence for designing or developing more effective requirements IR methods or tools based on generative LLMs.

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Title: Research on beam dynamics optimization of a storage ring based on machine learning

Abstract: This paper discusses the machine learning methods to optimize the beam dynamics of a storage ring for synchrotron light sources. In order to improve the stability of synchrotron radiation, we have developed a new method of machine learning-based closed orbit feedback, and piloted it in the storage ring of the Shanghai Synchrotron Radiation Facility (SSRF). Then, we also introduce a new method using machine learning to calibrate linear optics. This method is different from the traditional linear optics from closed orbit (LOCO) method, which is based on singular value decomposition (SVD). The machine learning model does not need to be computed by SVD. Predicting dynamic apertures is also one of the machine learning applications discussed in this paper.

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Title: Using the convolutional neural network for accurate gas discrimination and concentration measurement by an ultrasonically radiated thermoelectric gas sensor

Abstract: Ultrasonic radiation can catalyze the redox reaction at the sensing surface of a gas sensor, which provides a new method to significantly raise the gas sensors' sensitivity and to discriminate gas species. In this work, a convolutional neural network (CNN) based model for species discrimination and concentration regression is proposed and developed for an ultrasonically assisted thermoelectric gas sensor, in order to achieve accurate results. The analyte gases are acetone, methanol, hydrogen and ethanol in clean air, respectively. The results demonstrate that the gas discrimination accuracy and concentration measurement error for the analyte gases are 98.75% and 4.5%, respectively, in the concentration range of 2%-20% LEL.

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医疗科技正在迎来一个全新的时代，医学图像领域技术逐渐成熟的同时，也在探索中出现了新的问题和新的研究方向。第四届医学图像与计算机辅助诊断国际会议 (MICAD2023) 将于2023年12月9-10日在英国剑桥及线上同步举办。会议聚焦于医学图像领域前沿的研究与实践，邀请国际知名专家就医学图像处理、医疗机器人、计算机视觉、人工智能，以及影像与临床医学、基础医学深度交叉的突破性进展做大会主题报告和特邀报告。权威观点将在此发声，前沿的技术与应用也将在此得到分享。现大会诚邀国内外高校、科研机构专家、学者，企业界人士及其他相关人员投稿并参会交流。

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