2022 7TH INTERNATIONAL CONFERENCE ON SIGNAL AND IMAGE PROCESSING

ICSIP 2022

July 20-22, 2022 | Suzhou, China

with workshop

ICHST 2022 4th International Conference on Hardware Security and Trust

ICISPP 2022 3rd International Conference on Information Security and Privacy Protection

BDAML 2022 International Conference on Big Data Analysis and Machine Learning

Co-sponsored by

IEEE 東南大學 SOUTHEAST UNIVERSITY

Hosted by

東南大學 SOUTHEAST UNIVERSITY | 网络空间安全学院 School Of Cyber Science and Engineering

東南大學 苏州校区 Southeast University Suzhou Campus

GENERAL INFORMATION

◆Conference Venue

苏州独墅湖世尊酒店

Worldhotel Grand Dushulake Suzhou

中国江苏省苏州工业园区启月街 299 号
299 Qiyue Street, Suzhou Industrial Park, Jiangsu 215123, China

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Meeting Time	GMT+8 (China Standard Time)
Weather	Suzhou Forecast Temperatures Jul.20-22 24~34℃ Sunny
苏州疫情防控最新政策	点击此处

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◆Onsite Registration

Go to the registration desk→ Inform the staff of your paper ID→ Sign-in→ Claim your conference kit.

◆Devices Provided by the Organizer

Laptops (with MS-Office & Adobe Reader) / Projectors & Screen / Laser Sticks

◆Materials Provided by the Presenter

Oral Session: Slides (pptx or pdf version). Format 16:9 is preferred.

Poster session: A1 (Length: 841mm, width:594mm) size poster. Poster printing will be in charged by the conference organizer. Please email us your posters before **15:00 July 13, 2022.**

◆Duration of Each Presentation

Onsite/Online Oral Session: 15min apiece, include 13min for presentation, 2min for Q&A.
Poster Session: 10min apiece, include 8min for presentation, 2min for Q&A.

◆NOTICE

※ Please wear your delegate badge (name tag) for all the conference activities. Lending your participant card to others is not allowed.
※ Please take good care of your valuables at any time during the conference. The conference organizer does not assume any responsibility for the loss of personal belongings of the participants during conference day.
※ Wear a Mask. Make sure your mask fits well with the nose clip. Avoid hands shaking and Skin-to-skin contact.

◆Zoom Meeting ID

Room	Meeting ID	Meeting Link
A	815 2380 4014	https://us02web.zoom.us/j/81523804014
B	854 3199 4650	https://us02web.zoom.us/j/85431994650
C	882 2389 3889	https://us02web.zoom.us/j/88223893889
D	889 4695 5175	https://us02web.zoom.us/j/88946955175

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- ✧ Conference Banner: here
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TABLE OF CONTENTS

WELCOME MESSAGE

We are pleased to welcome you to 2022 7th International Conference on Signal and Image Processing (ICSIP 2022) with workshop, ICHST 2022 (the 4th International Conference on Hardware Security and Trust), ICISPP 2022 (the 3rd International Conference on Information Security and Privacy Protection), and BDAML 2022 (International Conference on Big Data Analysis and Machine Learning). The conference is scheduled for July 20-22 in Suzhou, co-sponsored by Southeast University (China), hosted by the Suzhou Campus and the School of Cyber Science and Engineering.

The annual international conference is aimed to bring together the researchers, experts, and scholars around the world to exchange their research results and address open issues in related fields. We hope ICSIP would be able to achieve its objective in providing an effective forum for academician, researchers, and practitioners to advancing knowledge, research, and technology for humanity. It is one of the leading international conferences for presenting novel and fundamental advances in the fields of signal and image processing. ICSIP was held successfully in Beijing 2016, Singapore 2017, Shenzhen 2018, Wuxi 2019, online 2020 (due to COVID-19), and Nanjing (hybrid conference) 2021.

This year's Suzhou conference will consist of 13 oral sessions and 1 poster session, 5 keynote talks from *Xiao-Ping Zhang* (Ryerson University), *Deshuang Huang* (Tongji University), *Haizhou Li* (National University of Singapore), *Jingyi Yu* (ShanghaiTech University), and 1 plenary speech given by *Kaizhu Huang* (Duke Kunshan University). 5 invited talks are given by *Yong Jia* (Chengdu University of Technology), *Qing Li* (Anhui Agricultural University), *Jiahua Zhu* (National University of Defense Technology), *Chuan Qin* (University of Shanghai for Science and Technology), and *Di Fan* (Shandong University of Science and Technology).

It is pleasing to note that the agenda of this conference covers a wide range of interesting topics related to all theoretical and practical aspects, but not limited to Computer and Information Science, Signal Measurement and Image Detection, Image Analysis and Methods, Signal Acquisition and Detection, Object Detection and Algorithms, Radar Systems and Signal Processing, Computer Vision and Imaging, Modern Electronic Systems and Digital Communication.

Last but not least, our deepest gratitude goes to the Advisory Board, Organizing Committee, International Scientific Committee, institutions, and volunteer who have directly and indirectly supported the success of this seminar. Wish you a very productive conference with exciting and encouraging discussions and exchange of knowledge so that together we can anticipate a future of ground-breaking knowledge, research, and technology.

Finally, we wish you a very successful conference! Hope you will enjoy your stay to Suzhou.

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Suzhou, July 2022

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Dr. Guojian Cheng, Monash Suzhou Research Institute, China
Dr. Hui Chen, Guilin University of Electronic Technology, China
Dr. Jie Sun, Southeast University, China
Dr. Mohammed Mahmoud, Beijing Institute of Technology, China
Dr. Parfait I. Tebe, University of Electronic Science and Technology of China, China
Dr. Peibo Duan, Monash Suzhou Research Institute, China
Dr. Peixian Zhuang, Tsinghua University, China
Dr. Qing Li, Donghua University, China
Dr. Saeed Mian Qaisar, Effat University, KSA
Dr. Shahzad Ashraf, Hohai University, China
Dr. Shaoguang Huang, Ghent University, Belgium
Dr. Sompong Liangrocapart, Mahanakorn University of Technology, Thailand
Dr. Songting Li, National University of Defense Technology, China
Dr. Suphongsa Khetkeeree, Mahanakorn University of Technology, Thailand
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AGENDA OVERVIEW

Venue in Suzhou:	苏州独墅湖世尊酒店 2F. Meeting Room M6, M7, M8.	
Zoom Meeting ID:	Room A: 815 2380 4014 Room B: 854 3199 4650 Room C: 882 2389 3889 Room D: 889 4695 5175	Link: https://us02web.zoom.us/j/81523804014 Link: https://us02web.zoom.us/j/85431994650 Link: https://us02web.zoom.us/j/88223893889 Link: https://us02web.zoom.us/j/88946955175

July 20 | Wednesday (GMT+8)		
10:00~17:00	Onsite Registration in Suzhou	苏州独墅湖世尊酒店 1F
	Zoom Pre-test for ALL Online Attendees	See page 11

July 21 | Thursday (GMT+8)			
Zoom Room A: 815 2380 4014 <2F. Meeting Room M6>			
09:00-09:10	Chairman / Conf. Co-chair	Prof. Bing Li. Southeast University	
	Opening Remarks from Conf. Co-chair	Prof. Jiuxin Cao. Southeast University	
09:10-09:55	**Keynote Speech I** A Foundation Framework for Graph Signal Processing	**Prof. Xiao-Ping (Steven) Zhang** FIEEE. Ryerson University	
09:55-10:40	**Plenary Speech** Towards Robust Deep Neural Networks with Adversarial Training: Fundamentals, Theories and Outlook	**Prof. Kaizhu Huang** Duke Kunshan University	
10:40-11:00	Group Photo & Morning Break		
11:00-11:45	**Keynote Speech II** Neural Modeling and Rendering for MetaHuman Creation	**Prof. Jingyi Yu** FIEEE. ShanghaiTech University	
11:45-12:30	**Keynote Speech III** Deep Learning for Motif Mining in Biological Sequences	**Prof. Deshuang Huang** FIEEE. Tongji University	
12:30-14:00	Lunchtime <1F 逸景亭西餐厅 Western Restaurant The Octagon>		
14:00-14:45	**Keynote Speech IV** Recent Advances in Selective Auditory Attention	**Prof. Haizhou Li** FIEEE, ISCA Fellow. National University of Singapore	
14:45-15:00	Afternoon Break		
15:00-17:50	**Meeting Room M6** Room A: 815 2380 4014	**Meeting Room M7** Room B: 854 3199 4650	**Meeting Room M8** Room C: 882 2389 3889
	Onsite Session 1: Signal Measurement and Image Detection Invited Talk – Yong Jia IP042, IP139, IP099 IP019, IP114, IP085, IP091 IP162, IP116, IP108	**Onsite Session 2:** Image Analysis and Methods IP151, IP123, IP147, IP016 IP127, IP124, IP051, IP101 IP136, IP158, IP110	**Onsite Session 3:** Computer and Information Science Invited Talk - Qing Li IP109, IP129, IP089, IP024 IP145, IP132, IP6001, IP061 IP161
17:50-19:00	ICSIP2022 www.icsip.org	ICSIP2022 www.icsip.org	**Poster Session:** Intelligent Image Processing and Signal Analysis IP067, IP149, IP060, IP086 IP138, IP056, IP113, IP052 IP077, IP087, IP104, IP047

July 22 | Friday (GMT+8)			
Room A: 815 2380 4014	**Room B: 854 3199 4650**	**Room C: 882 2389 3889**	**Room D: 889 4695 5175**
09:00-12:05			
Online Session 1: Radar Systems and Signal Processing Invited Talk - Jiahua Zhu IP011, IP040, IP049, IP082 IP121, IP069, IP014, IP020 IP065, IP106, IP102	**Online Session 2:** Acoustics and Signal Measurements IP050, IP075, IP133, IP141 IP015, IP120, IP072, IP005 IP168, IP088, IP041, IP112	**Online Session 3:** Signal Analysis and Processing IP025, IP603, IP009, IP010 IP030, IP031, IP053, IP152 IP126, IP080, IP008, IP006	**Online Session 4:** Computer Vision and Imaging Invited Talk - Di Fan IP074, IP137, IP105, IP144 IP044, IP130, IP135, IP160 IP035, IP153, IP159
12:05-13:00 Break			
13:00-15:50			
Online Session 5: Image Analysis and Methods Invited Talk - Chuan Qin IP117, IP501, IP045, IP084 IP093, IP103, IP503, IP064 IP165	**Online Session 6:** Modern Electronic Systems and Digital Communication IP070, IP036, IP125, IP755 IP702, IP078, IP115, IP143 IP023, IP504	**Online Session 7:** Computer Science and Information Engineering IP001, IP022, IP026, IP046 IP013, IP756, IP602, IP134 IP0751, IP605, IP071, IP505	**Online Session 8:** Image Classification and Image Security IP055, IP059, IP100, IP118 IP166, IP751, IP079, IP027 IP150, IP609, IP081, IP140
15:50-16:00 Break			
16:00-18:45			
Online Session 9: Object Detection and Algorithms IP002, IP038, IP092, IP107 IP156, IP004, IP037, IP058 IP083, IP171, IP604, IP164	**Online Session 10:** Image Segmentation and Imaging Technology IP029, IP043, IP090, IP096 IP017, IP057, IP076, IP146 IP148, IP154, IP157		

Note:

The meeting room will open 30 minutes earlier than scheduled. Please enter your room 10-15 minutes early.

NO-SHOW POLICY Papers unpresented at the conference, without prior written approval by the Conference Technical Program Chair, will be removed from the final conference proceedings before uploading to IEEE Xplore. No refund will be approved to authors of those papers.

Zoom Pre-test for All Online Attendees

※Participants who are going to do an online presentation are required to join the Zoom pre-test on July 20 (Wed). Duration: 3 minutes apiece. Free to leave after you finish the rehearsal. 所有作线上报告的参会者，均需参加 7 月 20 日安排的 Zoom 测试。每人 3 分钟，完成即可离开。

◆Name Setting

Keynote Speaker: Keynote-Name　　Author: Paper ID-Name

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July 20 (Wed.)	Room B: 854 3199 4650			
10:00-11:00	11:00-12:00	13:30-14:30	14:30-15:30	15:30-16:00
IP011	IP050	IP025	IP006	IP159
IP040	IP075	IP603	IP074	IP117
IP049	IP133	IP009	IP137	IP501
IP082	IP141	IP010	IP105	IP045
IP121	IP015	IP030	IP144	IP084
IP069	IP120	IP031	IP044	IP093
IP014	IP072	IP053	IP130	IP103
IP020	IP005	IP152	IP135	IP503
IP065	IP168	IP126	IP160	IP064
IP106	IP088	IP080	IP035	IP165
IP102	IP041	IP008	IP153	/

July 20 (Wed.)	Room C: 882 2389 3889			
10:00-11:00	11:00-12:00	13:30-14:30	14:30-15:30	15:30-16:00
IP070	IP001	IP055	IP002	IP043
IP036	IP022	IP059	IP038	IP090
IP125	IP046	IP100	IP092	IP096
IP755	IP013	IP118	IP107	IP017
IP702	IP756	IP166	IP156	IP057
IP078	IP602	IP751	IP004	IP076
IP115	IP134	IP079	IP037	IP146
IP143	IP0751	IP027	IP058	IP148
IP023, IP026, IP029	IP071	IP150	IP083	IP154
IP504	IP505	IP609	IP171	IP157
IP140	IP112	IP081	IP164	IP605, IP604

※Participants who are unavailable during the above allocated time can join the rehearsal at **16:00-16:30**.

INTRODUCTION OF SPEAKERS

A Foundation Framework for Graph Signal Processing

Xiao-Ping (Steven) Zhang
Professor of Ryerson University, Canada
09:10~09:55 July 21 (Thur.)
2F Meeting Room M6. Room A: 815 2380 4014

Abstract: In this talk, I first introduce the basics and motivations of graph signal processing (GSP). Then we define a set of energy-preserving shift operators that satisfy many properties similar to their counterparts in classical signal processing, but are different from the shift operators defined in the literature. We decouple the graph structure represented by eigengraphs and the eigenvalues of the adjacency matrix or the Laplacian matrix. We further define autocorrelation and cross correlation functions of signals on the graph, enabling us to obtain the solution to the optimal filtering on graphs, i.e., the corresponding Wiener filtering on graphs and the efficient spectra analysis and frequency domain filtering in parallel with those in classical signal processing. This new shift operator based GSP framework enables us to extend the classical signal analysis on a general network.

Xiao-Ping (Steven) Zhang received B.S. and Ph.D. degrees from Tsinghua University, in 1992 and 1996, respectively, both in Electronic Engineering. He holds an MBA in Finance, Economics and Entrepreneurship with Honors from the University of Chicago Booth School of Business, Chicago, IL.

Dr. Zhang is Fellow of the Canadian Academy of Engineering, Fellow of the Engineering Institute of Canada, Fellow of the IEEE, a registered Professional Engineer in Ontario, Canada, and a member of Beta Gamma Sigma Honor Society. He is the general co-chair for 2021 IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP2021). He is the general co-chair for 2017 GlobalSIP Symposium on Signal and Information Processing for Finance and Business, and the general co-chair for 2019 GlobalSIP Symposium on Signal, Information Processing and AI for Finance and Business. He is an elected member of IEEE International Conference on Multimedia and Expo (ICME) steering committee. He is the general chair for MMSP2015. He is the publicity co-chair for ICME'06 and founding program co-chair for ICIC2005. He has served as guest editor for the Multimedia Tools and Applications Journal. He is a tutorial speaker in ACM Multimedia 2011 (ACMMM2011), 2013 IEEE International Symposium on Circuits and Systems (ISCAS2013), 2013 IEEE International Conference on Image Processing (ICIP2013), ICASSP2014, 2017 International Joint Conference on Neural Networks (IJCNN 2017) and ISCAS2019. He is Senior Area Editor for IEEE Transactions on Signal Processing and IEEE Transactions on Image Processing. He served as Associate Editor for IEEE Transactions on Signal Processing, IEEE Transactions on Image Processing, IEEE Transactions on Multimedia, IEEE Transactions on Circuits and Systems for Video Technology, and IEEE Signal Processing Letters. He received 2020 Sarwan Sahota Ryerson Distinguished Scholar Award – the Ryerson University highest honor for scholarly, research and creative achievements. He is selected as an IEEE Signal Processing Society Distinguished Lecturer for the term from January 2020 to December 2021, and an IEEE Circuits and Systems Society Distinguished Lecturer for the term 2021 to 2022.

He is the Vice Chair (Chair-Elect) of Image, Video, and Multidimensional Signal Processing Technical Committee (IVMSP TC) for the term 2020-2021, an elected member of Multimedia Signal Processing Technical Committee (MMSP TC), Industry DSP Technology Standing Committee (IDSP SC), Signal Processing Theory and Methods Technical Committee (SPTM TC) and Sensor Array and Multichannel Technical Committee (SAM TC) of IEEE Signal Processing Society. He is an elected member of Visual Signal Processing and Communications Technical Committee (VSPC TC), System and Applications Technical Committee (MSA TC), and Digital Signal Processing Technical Committee (DSP TC) of IEEE Circuits and Systems Society.

Towards Robust Deep Neural Networks with Adversarial Training: Fundamentals, Theories and Outlook

Kaizhu Huang

Professor of Electrical and Computer Engineering, Duke Kunshan University

09:55~10:40 July 21 (Thur.)

2F Meeting Room M6. Room A: 815 2380 4014

Abstract: Deep neural networks (DNN) have achieved great success in many applications. However, recent research investigations show that DNNs are vulnerable on small perturbations of input data, making them less trustable to be applied in security-critical scenarios. In this talk, we present a unified perspective to build up a robust and safe DNN framework. In particular, we discuss a minmax adversarial training strategy that has been theoretically justified and empirically validated on many real data. Fundamentals, theories, and outlook will be discussed in this talk with intuitive visualizations and numerical verifications. Connections will be also established among various robust models. This talk will be mainly based on our recent research of adversarial training published at ICML, ICCV, ICDM, ACM Multimedia, AAAI, and ECCV.

Kaizhu Huang works on machine learning, neural information processing, and pattern recognition. He holds Tenured Full Professorship of ECE at Duke Kunshan University (DKU). Before joining DKU, he was a full professor at Xi'an Jiaotong-Liverpool University (XJTLU) and Associate Dean of Research in School of Advanced Technology, XJTLU. He also founded Suzhou Municipal Key Laboratory of Cognitive Computation and Applied Technology. Prof. Huang obtained his PhD degree from Chinese University of Hong Kong (CUHK) in 2004, Master degree from Institute of Automation, Chinese Academy of Sciences in 2000, and Bachelor degree from Xi'an Jiaotong-Liverpool University in 1997. He worked in Fujitsu Research Centre, CUHK, University of Bristol, National Laboratory of Pattern Recognition, Chinese Academy of Sciences from 2004 to 2012. He was the recipient of 2011 Asia Pacific Neural Network Society Young Researcher Award. He received best paper or book award seven times. He has published 9 books and over 200 international research papers (100+ international journals) e.g., in journals (JMLR, IEEE-TKDE, IEEE T-PAMI, IEEE T-NNLS, IEEE T-BME, IEEE T-Cybernetics) and conferences (NeurIPS, IJCAI, AAAI, SIGIR, UAI, ICDM, ICML, ECCV, CVPR, ICCV). He serves as associated editors/advisory board members in 6 international journals and book series. He was invited as keynote speaker in more than 30 international conferences or workshops.

Neural Modeling and Rendering for MetaHuman Creation

Jingyi Yu
Professor of ShanghaiTech University, China

11:00-11:45 July 21 (Thur.)
2F Meeting Room M6. Room A: 815 2380 4014

Abstract: Recent advances on deep learning, in particular, neural modeling and rendering, have renewed interests on developing effective MetaHuman creation tools. Such tools aim to overcome the limitations of traditional 3D reconstruction techniques such as structure-from-motion (SfM) and photometric stereo (PS) by reducing reconstruction noise, tackling texture-less regions, and synthesizing high quality free-view rendering. In this talk, I present recent efforts from my group at ShanghaiTech in collaboration with DGene on neural MetaHuman creation. Specifically, I demonstrate our latest neural human body reconstructor, deep 3D face synthesizer, anatomically correct 3D hand tracker, and ultra-realistic hair modeler. These solutions, coupled with markerless motion capture systems, can produce dynamic virtual humans at an unprecedented visual quality as well as lead to profound changes to MetaVerse creation technologies.

Jingyi Yu is the Vice Provost of ShanghaiTech University. He also serves as the Executive Dean of the School of Information Science and Technology at ShanghaiTech University. He received B.S. from Caltech in 2000 and Ph.D. from MIT in 2005. Before joining ShanghaiTech, he was a full professor at the University of Delaware. His research interests span a range of topics in computer vision and computer graphics, especially on computational photography and non-conventional optics and camera designs. He has published over 120 papers at highly refereed conferences and journals including over 70 papers at the premiere conferences and journals CVPR/ICCV/ECCV/TPAMI. He has also been granted 10 US patents. His research has been generously supported by the National Science Foundation (NSF), the National Institute of Health, the Army Research Office, and the Air Force Office of Scientific Research (AFOSR). He is a recipient of the NSF CAREER Award, the AFOSR YIP Award, and the Outstanding Junior Faculty Award at the University of Delaware. He has served as general chair, program chair, and area chair of many international conferences such as CVPR, ICCV, ECCV, ICCP and NIPS. He is currently an Associate Editor of IEEE TPAMI, IEEE TIP and Elsevier CVIU, and is the program chair of ICPR 2020, IEEE CVPR 2021, IEEE WACV 2021, and ICCV 2025. For his contributions to computer vision and computational photography, he was elevated to IEEE Fellow.

Deep Learning for Motif Mining in Biological Sequences

Deshuang Huang
Professor of Tongji University, China
11:45~12:30 July 21 (Thur.)
2F Meeting Room M6. Room A: 815 2380 4014

Abstract: Transcription factor (TF) plays a central role in gene regulation. Knowing the binding specificities of TFs is essential for developing models of the regulatory processes in biological systems and for deciphering the mechanism of gene expression. In this talk, we will introduce several novel computational models of TF binding data by combining various types of high-throughput data. Firstly, we will introduce a tensor decomposition model for collaborative prediction of ChIP-seq data, which could overcome its current limitation for integrative analysis. Secondly, we will present a de novo motif learning method based on the area under the receiver-operating characteristic curve (AUC) criterion, which has been widely used in the literature to evaluate the significance of extracted motifs. Finally, based on Fisher Exact Test score (FETS), we propose DirectFS, which is (to our best knowledge) the first FETS-based approach that allows direct learning of the motif parameters in continuous space. Experimental results based on real world high-throughput datasets illustrate that DirectFS outperforms competing methods for refining motifs found by de novo motif elicitation methods, while being one order of magnitude faster. In addition, we also present the possibility for using deep learning technique combining motif mining in biological sequences to address the medical image processing issue.

De-Shuang Huang is a Professor in Institute of Machine Learning and Systems Biology, EIT Institute for Advanced Study, China and Tongji University, China. He is currently the Fellow of the IEEE (IEEE Fellow), the Fellow of the International Association of Pattern Recognition (IAPR Fellow), the Fellow of the Asia-Pacific Artificial Intelligence Association (AAIA), and associated editors of IEEE/ACM Transactions on Computational Biology & Bioinformatics and IEEE Transactions on Cognitive and Developmental Systems, etc. He founded the International Conference on Intelligent Computing (ICIC) in 2005. ICIC has since been successfully held annually with him serving as General or Steering Committee Chair. He also served as the 2015 International Joint Conference on Neural Networks (IJCNN2015) General Chair, July12-17, 2015, Killarney, Ireland, the 2014 11th IEEE Computational Intelligence in Bioinformatics and Computational Biology Conference (IEEE-CIBCBC) Program Committee Chair, May 21-24, 2014, Honolulu, USA. He has published over 470 papers in international journals, international conferences proceedings, and book chapters. Particularly, he has published over 240 SCI indexed papers. His Google Scholar citation number is over 20080 times and H index 76. His main research interest includes neural networks, pattern recognition and bioinformatics. His main research interest includes neural networks, pattern recognition and bioinformatics.

Recent Advances in Selective Auditory Attention

Haizhou Li
Professor of National University of Singapore, Singapore

14:00~14:45 July 21 (Thur.)
2F Meeting Room M6. Room A: 815 2380 4014

Abstract: Humans have a remarkable ability to pay their auditory attention only to a sound source of interest, that we call selective auditory attention, in a multi-talker environment or a Cocktail Party. However, signal processing approach to speech separation and/or speaker extraction from multi-talker speech remains a challenge for machines. In this talk, we study the deep learning solutions to monaural speech separation and speaker extraction that enable selective auditory attention. We also introduce their applications in speech recognition, speaker recognition, and hearing aids. We discuss the computational auditory models, technical challenges and the recent advances in the field.

Haizhou Li received the B.Sc, M.Sc, and Ph.D degrees in electrical and electronic engineering from South China University of Technology, Guangzhou, China in 1984, 1987, and 1990 respectively. He is now a Presidential Chair Professor and Associate Dean (Research) at the School of Data Science, The Chinese University of Hong Kong (Shenzhen). Dr. Li is also with the Department of Electrical and Computer Engineering, National University of Singapore (NUS), Singapore.

Dr. Li has worked on speech and language technology in academia and industry since 1988. He has taught in The University of Hong Kong (1988-1989), South China University of Technology in Guangzhou, China (1990-1994), Nanyang Technological University in Singapore (2006-2016), University of Eastern Finland (2009), and University of New South Wales (since 2011). He was a Visiting Professor at CRIN/INRIA in France (1994-1995). Prior to joining CUHKSZ and NUS, he was a Research Manager in Apple-ISS Research Centre (1996-1998), Research Director of Lernout & Hauspie Asia Pacific (1999-2001), Vice President of InfoTalk Corp. Ltd and General Manager of InfoTalk Technology (Singapore) Pte Ltd (2001-2003), the Principal Scientist and Department Head of Human Language Technology at the Institute for Infocomm Research (2003-2016), and the Research Director of the Institute for Infocomm Research (2014-2016), the Agency for Science, Technology and Research, Singapore. He co-founded Baidu-I2R Research Centre in Singapore (2012). Dr. Li was known for his technical contributions to several award-winning speech products, such as Apple's Chinese Dictation Kits for Macintosh (1996) and Lernout & Hauspie's Speech-Pen-Keyboard Text Entry Solution for Asian languages (1999). He was the architect of a series of major technology deployments that include TELEFIQS voice-automated call centre service in Singapore Changi International Airport (2001), voiceprint engine for Lenovo A586 Smartphone (2012), and Baidu Music Search (2013).

Dr. Li was the recipient of National Infocomm Awards 2002, Institution of Engineers Singapore (IES) Prestigious Engineering Achievement Award 2013 and 2015, President's Technology Award 2013, and MTI Innovation Activist Gold Award 2015 in Singapore. He was named one of the two Nokia Visiting Professors in 2009 by Nokia Foundation, IEEE Fellow in 2014 for leadership in multilingual, speaker and language recognition, ISCA Fellow in 2018 for contributions to multilingual speech information processing, and Bremen Excellence Chair Professor in 2019. Dr. Li is a member of ACL, ACM, and APSIPA.

INTRODUCTION OF INVITED SPEAKERS

Human Activity Recognition Based on Multiple Radar Representations and Deep Learning

Prof. Yong Jia
Chengdu University of Technology, China
15:00~15:20 July 21 (Thur.)
2F Meeting Room M6. Room A: 815 2380 4014

Abstract: Deep learning and radar make it feasible to automatically recognize human activities in various lighting conditions, even occlusion case, which significantly promotes the application of activity recognition in the fields of security surveillance, health care, human–computer interaction and so on. This lecture mainly proposes discrete and continuous recognition modes by utilizing deep learning to extract and fuse different types of features from multiple radar representations. Specifically, the stepped-frequency continuous-wave (SFCW) radar is utilized to collect multiple periods and multiple frequencies of human echoes. On the one hand, the inverse Fourier transform is used to generate the time-range image representation along the same period. On the other hand, multiple different frequencies of time-frequency spectrogram representations are acquired through short-time Fourier transform (STFT) along each frequency. Moreover, four additional time-frequency analysis methods are introduced to form different classes of spectrograms. Obviously, the various representations including time-range image, multi-frequency spectrograms and multi-class spectrograms provide distinct and complementary feature expressions for the same human activity. With respect to discrete and continuous recognition modes, multiple specific deep learning networks are designed to extract and fuse these features associated with human activities from the various representations. Experimental results demonstrate that the presented deep learning schemes incorporating multiple radar representations have achieved higher success recognition rate for six or eight types of human activities than the existed methods based on single or less representations.

Yong Jia received the B.E. degree in electronic information engineering from Shandong Normal University, Jinan, China, in 2007, and the M.E. degree in information and communication engineering and the Ph.D degree in signal and information processing from University of Electronic Science and Technology of China, Chengdu, China, in 2010 and 2014, respectively. He is currently an Associate Professor with the School of Mechanical and Electrical Engineering, Chengdu University of Technology, Chengdu, China. From February 2013 to August 2013, he was a visiting scholar with the College of Engineering, Villanova University, PA, USA. His research interests include radar signal processing, image processing and artificial intelligence. He was a Reserve candidate for Academic and Technical Leader of Sichuan and a recipient of the first prize of Sichuan Science and Technology Progress Award.

Condition Health Monitoring of Rotating Machinery with Quaternion-based Method

Assoc. Prof. Qing Li
Anhui Agricultural University, China
15:40~15:20 July 21 (Thur.)
2F Meeting Room M8. Room C: 882 2389 3889

Abstract: In the field of prognostic and health management (PHM), prognostic models and algorithms with respect to single channel data are widely reported and used in industrial area, leading a critical vulnerability that the coupled nature and spatiotemporal relationship of the multi-dimensional data collected from multi-channel sensors cannot be captured. To address this issue, several new quaternion-based approaches are designed elaborately and shared in this conference report, for condition health monitoring of rotating machinery. Meanwhile, the process of model structure as well as its solving algorithm will be presented. The prognostic behavior of the proposed approaches is investigated via several experimental cases such as bearing run-to-failure dataset and acoustic dataset., and the availability of the proposed approaches is achieved compared with three state-of-the-art benchmarks. Eventually, future prospects such as degradation databases of typical devices, next generation artificial intelligence learning, and visualization research, remote PHM and maintenance system, are drawn and discussed.

Qing Li received the Ph.D degree from College of Mechanical Engineering, Donghua University, Shanghai, in 2019. He was a Post-doctoral Research Fellow in the Department of Mechanical Engineering at the University of Alberta, Edmonton, Canada, from 2019.06 to 2020.06. He was a visiting researcher at Georgia Institute of Technology, Atlanta, USA, from

2016.12 to 2018.07. He is currently an Associate Professor in Department of Mechanical Engineering at the Anhui Agricultural University, Hefei, China. His technical interests focus on dynamic signal processing, fault diagnosis and PHM.

Echo Weighting Design on Complementary Sets for Range Sidelobe Suppression

Assoc. Prof. Jiahua Zhu
National University of Defense Technology, China
09:00~09:20 July 22 (Fri.)
Room A: 815 2380 4014

Abstract: Golay complementary waveforms have been validated effective to obtain desired range sidelobe suppression performance around zero-Doppler band, at the cost of Doppler resolution, through several kinds of weighting design schemes at the receiver during the matched filtering. However, only a few literatures concern about the corresponding suppression effect of the weights on complementary sets. Based on this motivation, an echo weighting design method for complementary sets is introduced in this paper, as a compared approach to the widely researched weights—Binominal Design (BD) employed on the Golay. Better sidelobe suppression performance as well as an enhanced Doppler resolution is brought by our method, by sacrificing acceptable processing time and range sidelobe blanking level in the blanking area.

Jiahua Zhu received the B.S. degree in electronic engineering and Ph.D. degrees in information and communication engineering from the National University of Defense Technology, Changsha, China, in 2012 and 2018, respectively. He is currently an associate professor with the College of Meteorology and Oceanology, National University of Defense Technology. From November 2015 to November 2017, he was a visiting Ph.D. student with the School of Engineering, RMIT University, and the Department of Electrical and Electronic Engineering, University of Melbourne, Australia. His current research interests include waveform design and target detection for radar and sonar. He received the Best Paper Award in The 9th Research Symposium for Chinese PhD Students and Scholars in Australia, 2016, the Excellent Paper Award in 2021 IEEE/OES China Ocean Acoustics Conference, and the outstanding Ph.D. degree thesis of the Chinese People's Liberation Army (PLA), 2020. He was a technical committee member and an invited speaker of IEEE International Conference on Signal and Image Processing (ICSIP 2020), ICSIP2021 (Session Chair) and ICSIP2022 (Regional Chair of Changsha, China).

Research on Isolated Word Recognition Algorithm in Sign Language Video

Prof. Di Fan
Shandong University of Science and Technology, China
09:00~09:20 July 22 (Fri.)
Room D: 889 4695 5175

Abstract: Automatic sign language recognition is to convert sign language into speech or text, which provides a convenient and natural communication for people with speech and hearing impairments, and plays an important role in their better integration into society. In addition, Sign language recognition technology also has important applications in the field of human-computer interaction. However, it is difficult to recognize sign language due to the small area of the hand, complex movement, fast movement speed, easy crossing, occlusion and blur, and the current recognition rate and speed also affect the practical application. Our team researched the sign language recognition technology based on deep learning, aiming to solve the problem of recognition rate and recognition speed. Firstly, an improved 3D-ResNet isolated word sign language recognition algorithm based on hand region is proposed. The hand detection network and sign language recognition network are improved and optimized, and a sign language recognition system is designed based on theory, which achieves a high recognition rate. At the same time, the problem of network lightness is also studied, and a light isolated word sign language recognition algorithm based on a convolutional neural network and multiple attention is proposed, which can reduce model parameters and improve recognition speed while maintaining recognition rate basically. The two methods are tested on the Chinese Sign Language dataset, and the results show that the proposed method achieves a satisfactory recognition effect and has good accuracy and generalization ability. Although the research has promoted sign language recognition and its application, there is still a long way to go. For example, the number of

isolated words needs to be expanded; leap from isolated word recognition to sentence recognition; propose a lighter algorithm that can run on smaller devices and so on.

Di Fan received her Ph.D. degree of Control Theory and Control Engineering in 2010 from Shandong University of science and technology, China. In 2013, she worked as a visited scholar in the Massachusetts Institute of Technology in the United States for one year. She servers teaching and researching at Shandong University of Science and Technology since 2000, and is now a professor and graduate tutor of Shandong University of Science and Technology. Her main research activities are in the fields of ultrasonic testing, signal/image processing, machine vision, deep learning, etc. She has presided over and participated in over 10 national, provincial and ministerial projects such as international scientific and technological cooperation, 863 of the General Armament Department, National Natural Science Foundation of China, and the National Language Commission, and undertook 8 research and development projects commissioned by enterprises; She has published more than 50 papers, of which nearly 30 were indexed by SCI/EI and has got 8 invention patents; She has won the first prize of Science and Technology Progress Award of the Ministry of Education, the first prize of Shandong Province Technological Invention Award, and the second prize of Shandong Province Science and Technology Progress Award.

Perceptual Image Hashing

Prof. Chuan Qin
University of Shanghai for Science and Technology, China
13:00~13:20 July 22 (Fri.)
Room A: 815 2380 4014

Abstract: In this talk, the concept of perceptual image hashing and its differences with cryptographic and retrieval hashing are first given. Then, we illustrate some typical application scenarios of perceptual image hashing in the field of image intelligence security, and representative methods for perceptual image hashing and some of our works are introduced. Finally, the summary and further development are discussed.

Chuan Qin received his Ph.D. degree in signal and information processing from Shanghai University, Shanghai, China, in 2008. Since Dec. 2008, he has been with the faculty of University of Shanghai for Science and Technology, where he is currently a Professor. He was with Feng Chia University at Taiwan as a Postdoctoral Researcher and Adjunct Assistant Professor from July 2010 to July 2012. His research interests include image processing, multimedia security and AI security. He has published over 150 peer-reviewed papers in journals and conferences including IEEE TIP, IEEE TMM, IEEE TCSVT, IEEE Multimedia Magazine, IEEE SPL and Information Sciences. He is selected as the Highly Cited Chinese Researcher by Elsevier in 2020. He won the Best Paper Award of CIHW 2016 and the Candidate of Excellent Paper Award of IEEE IIHMSP 2014. He has served as the Associate Editor for Signal Processing (Elsevier) and Journal of Visual Communication and Image Representation (Elsevier). He is the Senior Member of CCF and CSIG.

PARALLEL SESSION

July 21 (Thur.) 15:00-17:50

2F Meeting Room M6 || Room A: 815 2380 4014

Onsite Session 1: Signal Measurement and Image Detection

Session Chair: Prof. Yong Jia, Chengdu University of Technology, China

Time	Paper ID	Speech Title & Presenter
15:00-15:20	Invited Talk	Human Activity Recognition Based on Multiple Radar Representations and Deep Learning ***Prof. Yong Jia**, Chengdu University of Technology, China*
15:20-15:35	IP042	Prediction of Multi-Function Radar Signal Sequence Using Encoder-Decoder Structure ***Kangan Feng**, University of Electronic Science and Technology of China, China*
15:35-15:50	IP139	Fast Image Process and Detection of Distorted Blur-readable 2D Barcode ***Yuting Yang**, Sun Yat-sen University, China*
15:50-16:05	IP099	UWB vital sign signal recognition method based on SVM ***Siyun Liu**, China Coal Research Institute, China*
16:05-16:20	IP019	Joint Intra-Frame and Inter-Frame Integration Method for High Speed Weak Target Detection ***Longji Gao**, University of Electronic Science and Technology of China,China*
16:20-16:35	IP114	Improved Denosing Method for UWB Vital Signs Detection and Extraction ***Wenhao Xian**, China Coal Research Institute, China*
16:35-16:50	IP085	A Gaussian Mixture PHD filter based on energy accumulation ***Liping Guo**, National University of Defense Technology, China*
16:50-17:05	IP091	Non-contact heart rate measurement with optimization of variational modal decomposition algorithm ***Kunpeng Zhu**, Shandong University, China*
17:05-17:20	IP162	A super-resolution beamforming method for autonomous underwater vehicle towed nest linear array based on Sparse Bayesian Learning ***Junjie Wang**, National Innovation Institute of Defense Technology, China*
17:20-17:35	IP116	Audio-Visual Event and Sound Source Localization Based on Spatial-Channel Feature Fusion ***Xiaolong Zheng**, Shandong University, China*
17:35-17:50	IP108	Robust nonnegative matrix factorization basedbackground reconstruction for hyperspectral imageanomaly detection ***SONG Xiaorui**, Beijing Institute of Remote Sensing Information, China*

July 21 (Thur.) 15:00-17:45

2F Meeting Room M7 || Room B: 854 3199 4650

Onsite Session 2: Image Analysis and Methods

Session Chair:

Time	Paper ID	Speech Title & Presenter
15:00-15:15	IP151	Multi-Channel SAR Moving Target Detection by Integrating STAP and Faster R-CNN ***Xiaoyi Sun**, National University of Defense Technology, China*
15:15-15:30	IP123	Blockchain-based Federated Learning Framework Applied in Face Recognition ***Haipeng Zheng**, Southeast University, China*
15:30-15:45	IP147	Accuracy-efficiency Balanced Sampling Rate Found by Discrete Fourier Transform ***Jiongliang Lin**, Sun Yat-sen University, China*
15:45-16:00	IP016	Hyperspectral Image Few-shot Classification Based on Analogous Tensor Decomposition ***Haojin Tang**, Shenzhen University, China*
16:00-16:15	IP127	Feature Fused Attention Network for Acute Bilirubin Encephalopathy Classification ***Haoyu Zhang**, Hainan University, China*
16:15-16:30	IP124	Cancelable Face Template Protection based on Deep Neural Network ***Qianya Ma**, Southeast University, China*
16:30-16:45	IP051	Exposing Recaptured Images with Constrained Convolutional Neural Network ***Nan Zhu**, Xi'an Technological University, China*
16:45-17:00	IP101	Comparing the denoising effect of NMF with different auxiliary variables on face images ***Junfei Gu**, China Mobile Zijin (Jiangsu) Innovation Research Institute, China*
17:00-17:15	IP136	A Fast Algorithm for SAR Imaging of Ground Moving Target Based on TRP-DPT and NUFFT ***Shuhua Tan**, Nanjing Research Institute of Electronics Technology, China*
17:15-17:30	IP158	Wide Range Swath SAR Imaging Method Based on Coherent Frequency Diverse Array Radar ***Xiaohui Zhao**, National University of Defense Technology, China*
17:30-17:45	IP110	Building Extraction from Remote Sensing Images with Conditional Generative Adversarial Networks ***Hongshun Chen**, Beijing Normal University, China*

JULY 21 (Thur.) 15:00-17:35

2F Meeting Room M8 || Room C: 882 2389 3889

Onsite Session 3: Computer and Information Science

Session Chair: Assoc. Prof. Qing Li, Donghua University, China

Time	Paper ID	Speech Title & Presenter
15:00-15:20	Invited Talk	Condition Health Monitoring of Rotating Machinery with Quaternion-based Method ***Assoc. Prof. Qing Li,*** *Donghua University, China*
15:20-15:35	IP109	Online Nonnegative Matrix Factorization with Temporal Affinity ***Miao Cheng****, Guangxi Normal University, China*
15:35-15:50	IP129	Multi-scale Convolutional Network for fMRI-based Diagnosis of Autism Spectrum Disorder ***Heqian Zhang****, Hainan University, China*
15:50-16:05	IP089	PAPR Reduction with Compressive Sensing for Joint Radar and Communication system ***Xunnan Zheng****, Nanjing University of Science and Technology, China*
16:05-16:20	IP024	Low Complexity Spatial Covariance Matrix Reconstruction Algorithm in 2D Hybrid Massive MIMO Systems ***Shujun Ye****, Northwest University, China*
16:20-16:35	IP145	Research on Improvement of DES Encryption Algorithm ***Xu Zhang****, Hubei Normal University, China*
16:35-16:50	IP132	Endoscope image enhancement algorithm based on pair of complementary gamma functions ***Qianqian Fang****, Anhui University, China*
16:50-17:05	IP6001	Research on Encryption Technology of CAA Software Based on RSA Algorithm and Hardware Information Extraction ***Wenguo Zhang****, Chengdu Aircraft Industrial (Group) Co., Ltd., China*
17:05-17:20	IP061	Remote Patients Monitoring and Pretreatment in 5G-Based Mobile Hospital Systems ***Parfait I. Tebe****, University of Electronic Science and Technology of China, China*
17:20-17:35	IP161	A Matrix Inversion Method Based on LDLT Decomposition and its Application in STAP ***Wei Li****, Nanjing Research Institute of Electronics Technology, China*

July 21 (Thur.) 17:50-19:00

2F Meeting Room M8

Poster Session: Intelligent Image Processing and Signal Analysis

Session Chair: Dr. Parfait Tebe, University of Electronic Science and Technology of China, China

Order	Paper ID	Speech Title & Presenter
#1	IP067	Hierarchical Sequential Feature Extraction Network for Radar Target Recognition Based on HRRP ***Qi Liu**, National University of Defence Technology China, China*
#2	IP149	DOA Estimation Algorithm Based on Extension and Shift of Sparse Polarization Sensitive Array ***Manling Yang**, Nanjing Research Institute of Electronics Technology, China*
#3	IP060	Anti-jamming method of MIMO-SAR with dual modulation of APC and OFDM ***Qifeng Yu**, Nanjing University of Aeronautics and Astronautics, China*
#4	IP086	Spectrogram-based Frequency Hopping Signal Detection in a Complex Electromagnetic Environment ***Zhe Deng**, National University of Defense Technology, China*
#5	IP138	Multi-constraint PRF Selection for Airborne Squint Spotlight SAR ***Jiahang Jin**, Nanjing Institute of Electronic Technology, China*
#6	IP056	Kernel based Sampling of Graph Signals via Graph Sampling Expansion Theorem ***Fen Wang**, Zhejiang Lab, Hangzhou, China*
#7	IP113	Dynamic multi-hop networking and cellular data offloading in Proximity Radio Access Network ***Nuoya Zhang**, Research Institute of China Telecom, China*
#8	IP052	An Improved Image Denoising Method Based on V ariable-order Fractional-Order Anisotropic Diffusion ***Xiaohu Shu**, National University of Defense Technology, China*
#9	IP077	Implementation of Terahertz Video SAR Imaging Based on Multi-Core DSP ***Tao Wang**, Nanjing University of Aeronautics and Astronautics, China*
#10	IP087	Sparse Aperture ISAR Imaging Method based on Meta-CV-ADMMN ***Ruize Li**, National University of Defense Technology, China*
#11	IP104	Weakly-Supervised Crack Segmentation via Scribble Annotations ***Jianing Quan**, Tianjin University, China*
#12	IP047	Polarimetric CSAR Image Quality Enhancement Using Joint Subaperture Processing ***Yiying Zheng**, National University of Defense Technology, China*

July 22 (Fri.) 09:00-12:05

Room A: 815 2380 4014 || https://us02web.zoom.us/j/81523804014

Online Session 1: Radar Systems and Signal Processing

Session Chair: Assoc. Jiahua Zhu, National University of Defense Technology, China

Time	Paper ID	Speech Title & Presenter
09:00-09:20	Invited Talk	Echo Weighting Design on Complementary Sets for Range Sidelobe Suppression ***Assoc. Prof. Jiahua Zhu,*** *National University of Defense Technology, China*
09:20-09:35	IP011	DOA Estimation Using an Unfolded Deep Network in the Presence of Array Imperfections ***Liuli Wu****, China Electronic Device System- Engineering Corporation Beijing, China*
09:35-09:50	IP040	Radar Signal Sorting Based on Adaptive SOFM and Coyote Optimization ***Zongding Cui****, Beijing Institute of Technology, China*
09:50-10:05	IP049	Cognitive Radar Waveform Design Based on Multi-objective Optimization Criteria ***Fei Wu****, Beijing Institute of Technology, China*
10:05-10:20	IP082	Precise Scatter Estimation of Complex Bridges with Portable MMW SAR ***Jian Wang****, National University of Defense Technology, China*
10:20-10:35	IP121	A Target-region-based SAR ATR Adversarial Deception Method ***Fan Zhang****, Beijing University of Chemical Technology, China*
10:35-10:50	IP069	Comparison and Analysis of Coverage Capabilities of 2.1GHz 40M FDD and 3.5GHz 100M TDD in Indoor Coverage Scenarios of Outdoor Stations ***Mingshuo Wei****, Mobile and Terminal Technology Research Department, China*
10:50-11:05	IP014	Terrain recognition based on theCarrier-free UWB Radar using Stacked Denoising Autoencoder ***Xiaoxiong Li****, Nanjing University of Science and Technology, China*
11:05-11:20	IP020	The Influence of Meteorological Conditions on TV Satellite Signals in the Plateau ***Guowei Geng****, Soochow University, China*
11:20-11:35	IP065	Improved Strategy of Velocity Measurement for Moving Target ***Mingjiang Wang****, Beijing Jiaotong University, China*
11:35-11:50	IP106	Research on Space Multitargets Precise Tracking and Trajectory Prediction Algorithm ***Jianjuan Xiu****, Naval Aviation University, China*
11:50-12:05	IP102	An Improved Tracking Method for Distributed Passive Sonar System ***Pengfei Shao****, Hangzhou Applied Acoustics Research Institute, China*

July 22 (Fri.) 09:00-12:00

Room B: 854 3199 4650 || https://us02web.zoom.us/j/85431994650

Online Session 2: Acoustics and Signal Measurements

Session Chair: Prof. Weiwei Wang, Xidian University, China

Time	Paper ID	Speech Title & Presenter
09:00-09:15	IP050	Text-independent Speaker Recognition based on X-vector ***Lianyu Zhou**, HIT (Shen Zhen), China*
09:15-09:30	IP075	Speech recovery using adaptive noise canceller with multiple optimized primary channels ***Zhang Linxue**, Prefectural University of Hiroshima, China*
09:30-09:45	IP133	Micro-Doppler Parameter Estimation of Ships Based on the Viterbi Algorithm ***Fan Li**, Nanjing University of Science and Technology, China*
09:45-10:00	IP141	Mandarin Speech Recognition based on Chinese Syllable Similarity for Children ***Anchong Xu**, East China Normal University, China*
10:00-10:15	IP015	Automatic Modulation Classification Strategy Based on Novel Feature Processing ***Aersileng**, Harbin Engineering University, China*
10:15-10:30	IP120	Direction of Arrival Estimation Method under Sensor Failure Scenarios via covariance matrix completion ***Bing Sun**, China Satellite Maritime Tracking and Control Department, China*
10:30-10:45	IP072	An Angle Estimation Algorithm without Prior Knowledge for AESA Cooperative Detection Node ***Pengfei Leng**, Nanjing Marine Radar Institute, China*
10:45-11:00	IP005	A Deception Jamming Detection and Suppression Method for Multichannel SAR ***Yuefei Wang**, Nanjing University of Aeronautics and Astronautics, China*
11:00-11:15	IP168	Acquisition Algorithm of Beidou B1C Signal based on Improved Pseudo Correlation Function ***Yingchun Zhang**, Anhui Institute of Information Technology, China*
11:15-11:30	IP088	Implementation of blind source separation based on improved variable step-size natural gradient algorithm ***Shaofeng Peng**, Chengdu University of Technology, China*
11:30-11:45	IP041	Research on Interferometer Direction Finding Technology Based on Digital Beam forming ***Wenhui Zhou**, 91404 Troop China, China*
11:45-12:00	IP112	GB-Spaceborne Bistatic ISAR High-Speed Compensation Method for Weak and Small Space Targets ***Liang Li**, National University of Defense Technology, China*

July 22 (Fri.) 09:00-12:00

Room C: 882 2389 3889 || https://us02web.zoom.us/j/88223893889

Online Session 3: Signal Analysis and Processing

Session Chair: Assoc. Prof. Yan Zhou, Northwest University, China

Time	Paper ID	Speech Title & Presenter
09:00-09:15	IP025	Research of EEG signal analysis method based on fusion of Riemannian space and convolutional Neural network ***Zhao Kai**, Shandong Jianzhu University, China*
09:15-09:30	IP603	Privacy Computing Issues in Collecting and Using Customer Data of Smartphone and Mobile Platform ***Da Qi Ren**, Zeku Inc., United States*
09:30-09:45	IP009	Speech-based depression detection using unsupervised autoencoder ***Yubo An**, China Beijing Institute of Technology, China*
09:45-10:00	IP010	Multi-Task Sparse Signal Recovery with Dirichlet Process Priors Based on Expectation Propagation Technique ***Yin Fu**, Southeast University, China*
10:00-10:15	IP030	The Anti-Interference Algorithm of BPSK Spread Spectrum Signal Based on Generative Adversarial Networks ***Yuchen Sun**, Hangzhou Dianzi University, China*
10:15-10:30	IP031	Research on the classification algorithm of imaginary speech EEG signals based on twin neural network ***Qi Heting**, Shandong Jianzhu University,China*
10:30-10:45	IP053	An Improved TDOA-based DPD Method via Multiple-frequency Function Fusion ***Kehui Zhu**, Nanjing University of Aeronautics and Astronautics, China*
10:45-11:00	IP152	A fusion transfer learning method of motor imagery EEG signals based on Riemannian space ***Wang Yunhui**, Shandong Jianzhu University, China*
11:00-11:15	IP126	A method of Airborne SAR Noise Interference suppression Based on Blind Signal Separation ***Sixiang Wang**, Nanjing University of Science and Technology, China*
11:15-11:30	IP080	Design and Implementation of Image Signal Processor Based on CUDA ***Bo Zhang**, Dalian University of Technology, China*
11:30-11:45	IP008	A bit allocation method for object- based audio coding based on G.719 ***Gaoshun Wang**, Beijing Institute of Technology, China*
11:45-12:00	IP006	Correction of Intra-pulse Doppler Effect for SAR with Waveform Encoding ***Qiu Jin**, Nanjing University of Aeronautics and Astronautics, China*

July 22 (Fri.) 09:00-12:05

Room D: 889 4695 5175 || https://us02web.zoom.us/j/88946955175

Online Session 4: Computer Vision and Imaging

Session Chair: Assoc. Prof. Miaohui Wang, Shenzhen University, China

Time	Paper ID	Speech Title & Presenter
09:00-09:20	Invited Talk	Research on Isolated Word Recognition Algorithm in Sign Language Video ***Prof. Di Fan**, Shandong University of Science and Technology, China*
09:20-09:35	IP074	Adaptive Rescaling for Video Coding Optimization ***Siqian Qin**, Shanghai University, China*
09:35-09:50	IP137	An Analytical Model for Estimating Average Driver Attention Based on the Visual Field ***Nima Khairdoost**, The University of Western Ontario, Canada*
09:50-10:05	IP105	A Real Beam Sharpening Method Based on STFT for Multiple Moving Targets ***Gui Li**, Nanjing Research Institute of Electronics, China*
10:05-10:20	IP144	Low Complexity Rate-Adaptive Deep Joint Source Channel Coding for Wireless Image Transmission using Tensor-Train Decomposition ***Man Xu**, Macao Polytechnic University, China*
10:20-10:35	IP044	CICRNet: Clinical Information and Category Relation Improve Imbalanced Skin Cancer Diagnosis ***Yunjian Cao**, University of Electronic Science and Technology of China, China*
10:35-10:50	IP130	Image Fusion Based on Discrete Cosine Transform with high compression ***Emadalden Alhatami**, Hainan University, China*
10:50-11:05	IP135	Aedes aegypti Egg Morphological Property and Attribute Determination Based on Computer Vision ***Cherry R. Gumiran**, Technological Institute of the Philippines Quezon City, Philippines*
11:05-11:20	IP160	Determining the Acupoints on the Abdomen Using Synchrotron Radiation PCI-CT, DEI and XRF Methods ***Wang Xiaohua**, Yancheng Teachers University, China*
11:20-11:35	IP035	Jetson NX-oriented Armored Vehicle Fine-grained Recognition ***Jiabao Wang**, Army Engineering University of PLA, China*
11:35-11:50	IP153	Class Constraints-based Discriminative Features Learning Algorithm for Palm Print and Palm Vein Fusion Recognition ***Kunyan Zhang**, Anhui University, China*
11:50-12:05	IP159	A Fast Monocular Visual–Inertial Odometry Using Point and Line Features ***Weixiang Shen**, Army Engineering University of PLA, China*

July 22 (Fri.) 13:00-15:35

Room A: 815 2380 4014 || https://us02web.zoom.us/j/81523804014

Online Session 5: Image Analysis and Methods

Session Chair: Prof. Chuan Qin, University of Shanghai for Science and Technology, China

Time	Paper ID	Speech Title & Presenter
13:00-13:20	Invited Talk	Perceptual Image Hashing ***Prof. Chuan Qin**, University of Shanghai for Science and Technology, China*
13:20-13:35	IP117	Few-Shot HRRP Target Recognition Method Based on Gaussian Deep Belief Network and Model-Agnostic Meta-Learning ***Zuyu Ren**, National University of Defence Technology, China*
13:35-13:50	IP501	Viewpoint Contrastive and Adversarial Learning for Unsupervised Domain Adaptive Person re-Identification ***Ziheng Chen**, South China University of Technology, China*
13:50-14:05	IP045	Height Estimation from a Single SAR Image by Depth-Aware Proxyless Neural Architecture Search ***Xue Minglong**, Tianjin university, China*
14:05-14:20	IP084	Face Template Protection Through Incremental Learning and Error-Correcting Codes ***Li Nie**, Wuhan University of Technology, China*
14:20-14:35	IP093	Research on Three-dimensional Point Cloud Registration Algorithm ***Yuqing Zhang**, Shandong Technology and Business University, China*
14:35-14:50	IP103	To investigate the ability of CNN in learning specific frequency band of motor imagery EEG ***Chenyun Shi**, Anhui University, China*
14:50-15:05	IP503	Improved binarization algorithm of DM Code Image under complex Illumination ***Xiao Huichen**, Xiamen University of Technology, China*
15:05-15:20	IP064	A method of removing oil droplets from bearing image based on a two-stage neural network ***Song kangkang**, Chinese Academy of Sciences, China*
15:20-15:35	IP165	Enhancing Threshold-based Phenotyping by Normalizing Image Luminosity ***Joel Gumiran**, Technological Institute of the Philippines, Philippines*

July 22 (Fri.) 13:00-15:30

Room B: 854 3199 4650 || https://us02web.zoom.us/j/85431994650

Online Session 6: Modern Electronic Systems and Digital Communication

Session Chair: Assoc. Prof. Haifei Zhang, Nantong Institute of Technology, China

Time	Paper ID	Speech Title & Presenter
13:00-13:15	IP070	Communication optimization of body sensor network based on evolutionary multi-objective cooperative game ***Lanmei Qian**, Nantong Institute of Technology, China*
13:15-13:30	IP036	Large-Scale Micro-Power Sensors Access Scheme Based on Hybrid Mode in IoT enabled Smart Grid ***Rui shi**, State Grid Smart Grid Research Institute Co., Ltd., China*
13:30-13:45	IP125	A Threshold Setting Method for SPMA Protocol ***Zhe Li**, China Academy of Launch Vehicle Technology, China*
13:45-14:00	IP755	Unsupervised Title Generation from Unpaired Data with N-Gram Discriminators ***Ching-Sheng Lin**, Tunghai University, Taiwan*
14:00-14:15	IP702	Study on Penetration Testing Platform Oriented to CAN Bus Embedded System ***Wansheng Yang**, China Academy of Engineering Physic, China*
14:15-14:30	IP078	UEFI Security Threats Introduced by S3 and Mitigation Measure ***Weihua Jiao**, State Key Laboratory of Mathematical Engineering and Advanced Computing, China*
14:30-14:45	IP115	LPD Data Link in System-of-Systems Simulation ***Jie Zhang**, National Defense University, China*
14:45-15:00	IP143	A Method of Data Acquisition Network Delay Measurement for AFDX Avionics System in Flight Test ***Wei Zhang**, Chinese Flight Test Establishment, China*
15:00-15:15	IP023	Research on Neutron Penetration Characteristics of Structural Materials for Near Space Vehicles ***Heng Wang**, Science and Technology on Space Physics Laboratory, China*
15:15-15:30	IP504	A Bidirectional Remote Attestation Method for Electricity 5G Edge Computing Nodes ***Xiaojian Zhang**, State Grid Key Laboratory of Information & Network Security, China*

July 22 (Fri.) 13:00-16:00

Room C: 882 2389 3889 || https://us02web.zoom.us/j/88223893889

Online Session 7: Computer Science and Information Engineering

Session Chair: Prof. Akinori Ito, Tohoku University, Japan

Time	Paper ID	Speech Title & Presenter
13:00-13:15	IP001	Analyzing the Key Factors of Intelligence Confrontation based on System Dynamics ***Wu Henan**, Aviation University of Air Force, Changchun, China*
13:15-13:30	IP022	Prior Matching Operator in Self-Supervised Learning ***Dongliang Luo**, Fudan University, China*
13:30-13:45	IP026	Research on Mathematical Model for Vascular Cooling Effect of Tumor Magnetic Induction Conformal Hyperthermia ***Heng Wang**, Science and Technology on Space Physics Laboratory, China*
13:45-14:00	IP046	A Coherent Integration Method for High-Speed Target via Scale Effect Elimination and Across Range Unit Correction ***Zhi Sun**, University of Electronic Science and Technology of China, China*
14:00-14:15	IP013	Successive Binary Partition K-means Method for Clustering with Less Cluster Size Bias ***Akinori Ito**, Tohoku University, Japan*
14:15-14:30	IP756	How will the COVID-19 pandemic affect the Asian Games? A joint analysis of Olympic and pandemic big data ***Jianwei Guo**, Capital University of Physical Education and Sports, China*
14:30-14:45	IP602	Security Verification of Key Exchange in Ciphertext-Policy Attribute-Based Encryption ***Mohammed B. M. Kamel**, Eötvös Loránd University, Hungary*
14:45-15:00	IP134	LogST: Log Semi-Supervised Anomaly Detection Based on Sentence-BERT ***Mingyang Zhang**, Beijing University of Posts and Telecommunications, China*
15:00-15:15	IP0751	Cross-Example Patch Fusion for Face Anti-Spoofing ***Ziyuan Mao**, Southeast University, China*
15:15-15:30	IP605	NIN-DSC: A Network Traffic Anomaly Detection Method Based on Deep Learning ***Xin Li**, Shandong University, China*
15:30-15:45	IP071	Analysis of the Expressive Power of DIFC Model based on Temporal Logic ***Zhi Yang**, PLA Information Engineering University, China*
15:45-16:00	IP505	A Fast Matching Method of Trusted Whitelist Based on Bloom Filter ***Shuai Wang**, Southeast University, China*

July 22 (Fri.) 13:00-16:00

Room D: 889 4695 5175 || https://us02web.zoom.us/j/88946955175

Online Session 8: Image Classification and Image Security

Session Chair: Dr. Suphongsa Khetkeeree, Mahanakorn University of Technology, Thailand

Time	Paper ID	Speech Title & Presenter
13:00-13:15	IP055	A three-dimensional attention-connected convolutional network for acute bilirubin encephalopathy classification ***LinMao Tian**, Hainan University, China*
13:15-13:30	IP059	Research on Double-layer Feature Classification Algorithm for Liquid Dangerous Goods Detection Based on UWB Centimeter Wave ***Peng Wang**, Chengdu University of Technology, China*
13:30-13:45	IP100	Transfer Learning on EfficientNet for Maritime Visible Image Classification ***Mostafa Hamdy Salem**, Beijing University of Technology, China*
13:45-14:00	IP118	Quaternion Graph Wavelet Transform for Color Texture Classification ***Wei Cheng**, Harbin Engineering University, China*
14:00-14:15	IP166	An Intelligent garbage classification system using a lightweight network MobileNetV2 ***Hanxu Ma**, Anhui University, China*
14:15-14:30	IP751	Chinese Word Segmentation based on Word Boundary Classification ***Lu Li**, Southeast University, China*
14:30-14:45	IP079	Halftoning-Based Fragile Watermarking Approach for Digital Image Self-Recovery ***Qiyuan Zhang**, Macao Polytechnic University, Macao SAR, China*
14:45-15:00	IP027	Robust Fourier Watermarking for Print-Cam Process using Convolutional Neural Networks ***Said Boujerfaoui**, Ibn Zohr University, Morocco*
15:00-15:15	IP150	LSB-based random embedding image steganography technique using modified Collatz Conjecture ***Aimee D. Molato**, Technological Institute of the Philippines, Quezon City, Philippines*
15:15-15:30	IP609	Design and Implementation of Image Copyright Protection System Based on Chinese Cryptographic Algorithms ***Yajie Si,** Zhengzhou University of Light Industry, China*
15:30-15:45	IP081	Panoramic SAR Imaging System for Unmanned Ground Vehicles ***Yangsheng Hua**, National University of Defense Technology, China*
15:45-16:00	IP140	Frequency Hopping Signal Sorting based on Spectrum Monitoring Data by Adaptive DBSCAN ***Dejun He**, Army Engineering University of PLA, China*

July 22 (Fri.) 16:00-19:00

Room A: 815 2380 4014 || https://us02web.zoom.us/j/81523804014

Online Session 9: Object Detection and Algorithms

Session Chair: Assoc. Prof. Zhi Sun, University of Electronic Science and Technology of China, China

Time	Paper ID	Speech Title & Presenter
16:00-16:15	IP002	Research on Detection Method of Truck Face Based on Deformable Parts Model ***Xiaoming Qin**, Southeast University, China*
16:15-16:30	IP038	Ship Detection in Inland Rivers based on Multi-Head Self-Attention ***Nanjing Yu**, Chongqing Jiaotong University, China*
16:30-16:45	IP092	P-UNet: Parallel Attention based UNet for Crack Detection ***Xiaohu Zhang**, Sun Yat-sen University, China*
16:45-17:00	IP107	Specular Reflections Removal of Gastrointestinal Polyps Based on Endoscopic Image ***Kai Qian**, AnHui University, China*
17:00-17:15	IP156	Research on Head Object Detection Algorithm in Classroom Scene ***Zhiwei Zheng**, China University of Labor Relations, China*
17:15-17:30	IP004	Research on Methods of Truck Plate Detection in Expressway Scene Based on Machine Learning ***Jialun Wu**, Southeast University, China*
17:30-17:45	IP037	Dynamic Weight Coefficient based D-S Evidence Theory for Vehicle Fusion Detection in RGB-T Images ***Xunxun Zhang**, Xi'an University of Architecture and Technology, China*
17:45-18:00	IP058	Target detection based on information fusion of millimeter-wave radar and visual camera ***Guangyang Wan**, Chengdu University of Technology, China*
18:00-18:15	IP083	Image Tamper Detection Based on Two-Stream Attention Faster R-CNN ***Shiqian Yan**, Dalian University of Technology Dalian, China*
18:15-18:30	IP171	CNN Based on Multiscale Window Self-Attention Mechanism for Radar HRRP Target Recognition ***Yujia Diao**, National University of Defense Technology, China*
18:30-18:45	IP604	A Survey of DNS Tunnel Detection ***Xin Li**, Shandong University, China*
18:45-19:00	IP164	A Pose Estimation Method in Dynamic Scene with Yolov5, Mask R-CNN and ORB-SLAM2 ***Junchao Zhu**, Army Engineering University of PLA, China*

July 22 (Fri.) 16:00-18:45

Room B: 854 3199 4650 || https://us02web.zoom.us/j/85431994650

Online Session 10: Image Segmentation and Imaging Technology

Session Chair: Assoc. Prof. Xiaochen Yuan, Macao Polytechnic University, Macau, China

Time	Paper ID	Speech Title & Presenter
16:00-16:15	IP029	Research on Evaluation Method of Aerial Image Segmentation Algorithm ***Heng Wang**, Science and Technology on Space Physics Laboratory, China*
16:15-16:30	IP043	DP2Net: Defense Against Adversarial Examples by Detecting Perturbed Pixels ***Haitian Liu**, Beijing Institute of System Engineering, China*
16:30-16:45	IP090	Semantic Segmentation for Mangrove Using Spectral Indices and Self-Attention Mechanism ***Yu Fan**, East China Normal University, China*
16:45-17:00	IP096	Semi-automatic PFU Counting Method by Double Thresholding and Two-Stage Segmentation ***Nittaya Khamdee**, Chulalongkorn University, Thailand*
17:00-17:15	IP017	The Category-sample and Category-loss Human Body Parsing Algorithm ***Han Ping**, Wuhan University of Technology, China*
17:15-17:30	IP057	Image Segmentation for Autonomous Driving Using U-Net Inception ***Syed Muhammad Fasih Hussain**, Habib University, Pakistan*
17:30-17:45	IP076	Patient Registration of Intelligent Surgical Navigation System---Based On Improved ICP Algorithm ***Jie Wu**, Guilin University of Electronic Technology, China*
17:45-18:00	IP146	Depth Swin Transformer Unet for serial section biomedical image segmentation ***Jun Lin**, Nanjing University of Science & Technology, China*
18:00-18:15	IP148	Vector Flow Imaging by Plane Wave Speckle Tracking Based on Different Beamformers ***Ke Yang**, East China University of Science and Technology, China*
18:15-18:30	IP154	Research on simplified slant range model for BP algorithm applying to missile-borne SAR ***Chen Xue**, Beihang University, China*
18:30-18:45	IP157	Deep Learning with Modified loss function to Predict Gestational Age of the Fetal Brain ***Wen Nie**, Hubei University of Technology, China*

NOTE