

The 5th International Conference on Communication, Image and Signal Processing (CCISP 2020)

Conference Program

www.ccisp.org

Organized by
Sichuan University

Sponsored by
Asia Pacific Institute of Science and Engineering (APISE)

Technical sponsored by
IEEE Communication Society Chengdu Chapter

Nov. 13-15, 2020 • Chengdu, China

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WELCOME MESSAGE

Dear Participants,

Due to the outbreak of COVID-19, the whole world is struggling against the impact from all aspects. Unfortunately, each of us is affected, either overtly or covertly. Our conference, **the 5th International Conference on Communication, Image and Signal Processing (CCISP 2020)** is not an exception. To actively respond to the call of the government, to strengthen the protection work, to effectively reduce people gathering and prevent coronavirus transmission, CCISP 2020, which should be held in Chengdu, China during Nov. 13-15, 2020 as planned, considering that some participants could not attend in person, the conference is now adjusted as a combination of the on-line and off-line conference.

However, the adjustment of the conference form will not influence on papers' publication and index. Furthermore, there are two options: **#Option 1:** *Accepted and presented papers will be published into Conference Proceedings of CCISP 2020. The Conference Proceedings will be included in IEEE Xplore and indexed by EI Compendex, Scopus, Thomson Reuters (WoS)-CPCI, and other databases. **#Option 2:** Selected papers with great extension can be recommended to be published in Journal: Mathematical Problems in Engineering — Special issue: Advanced Intelligent Fuzzy Systems Modeling Technologies for Smart Cities, and will be submitted to Science Citation Index Expanded, Scopus, EI Compendex. etc for reviewing and indexing.

Also, the change of conference form will not influence on our conference's aim and pursuit. CCISP 2020 aims to present the latest research and results of scientists related to Communication, Image, Signal Processing and other topics. By off-line and on-line oral presentations as well as a poster presentation, this conference provides opportunities for the delegates to exchange new ideas, to establish business or research relations, and to find global partners for future collaborations. We hope that the conference results will lead to significant contributions to the knowledge in these up-to-date scientific fields.

We would like to thank our outstanding Keynote Speakers: Prof. Hao Ying from Wayne State University, USA; Prof. Edmund Lai from Auckland University of Technology, New Zealand; Prof. Ce Zhu from University of Electronic Science and Technology of China, China and invited speakers: Prof. Yiyu Cai from Nanyang Technological University (NTU), Singapore, Assoc. Prof. Han Zhang from Sichuan University, China; and Prof. Jun Cheng from UBTECH Research Institute, Shenzhen, China, for sharing their deep insights on future challenges and trends.

We would like to thank all the committees for their great support in organizing the conference. We

also would like to thank all the reviewers for their great effort in reviewing the papers submitted to CCISP 2020. Special thanks to all the researchers and students who with their work and participate in the conference.

We hope all is well with everyone, with families and friends.

A handwritten signature in black ink, appearing to be 'Jing Zhang', written in a cursive style.

General Chair

Prof. Jing Zhang, Sichuan University, China

CONFERENCE SPEAKERS

Keynote Speakers



Prof. Hao Ying
Wayne State University, USA

Biography: Dr. Hao Ying is a Professor with the Department of Electrical and Computer Engineering, Wayne State University, Detroit, Michigan, USA. He has published two fuzzy control books, over 120 journal papers, and more than 160 conference papers. His Google Scholar H-index is 51. He is ranked among the top 23,000 most-cited authors across all 22 scientific fields (176 subfields) selected from over 6.8 million scientists worldwide. He is an IEEE Fellow.

He is serving as an Associate Editor or a Member of Editorial Board for 9 international journals, including the IEEE Transactions on Systems, Man, and Cybernetics: Systems. He served in the same role in the past for 7 other international journals, including the IEEE Transactions on Fuzzy Systems. He served as a Member of the 2020 Fellow Evaluation Committee of both the IEEE Computational Intelligence Society and the IEEE Systems, Man, and Cybernetics Society (for which he served in 2016 and 2017 as well). He served as a Member of the Fuzzy Systems Technical Committee of the IEEE Computational Intelligence Society since 2008 (except 2014). He was elected to serve as a board member of the North American Fuzzy Information Processing Society for two terms (2005-2008 and 2008-2011). He served as Program Chair/Co-Chair for 4 international conferences and as Program/Technical Committee Member for over 110 international conferences.

Keynote Lecture: Predicting Unintentional Vehicle Lane Departure Using Support Vector Machine and Neural Network

Advanced driver assistance systems, such as unintentional lane departure warning systems, have recently drawn much attention and efforts. In this study, we explored utilizing the nonlinear binary support vector machine (SVM) technique as well as the three-layer neural network with the back-propagation learning scheme to predict unintentional lane departure. We developed a two-stage training scheme to improve SVM's prediction performance in terms of minimization of the number of false positive prediction errors. Experiment data generated by VIRTTEX, a hydraulically powered 6-degrees-of-freedom moving base driving simulator at Ford Motor Company were used. All the vehicle variables were sampled at 50 Hz and there were 16 drowsy drivers (about three-hour driving per subject) and six control drivers (approximately 20 minutes driving each). A total of 3,508 unintentional lane departures occurred for the drowsy drivers and 23 for the control drivers. Our study involving these 22 drivers with a total of over 7.5 million prediction decisions demonstrates that: (1) excellent SVM prediction performance, measured by numbers of false positives (i.e., falsely predicted lane departures) and false negatives (i.e., lane departures failed to be predicted), were achieved when the prediction horizon was 0.6 s or less, (2) lateral position and lateral velocity worked the best as SVM input variables among the nine variable sets that we explored, (3) the radial basis function performed the best as the SVM kernel function, and (4) the SVM produced more accurate lane departure prediction than the neural network did.



Prof. Edmund Lai

Auckland University of Technology, New Zealand

Biography: Edmund joined AUT in February 2016. He obtained his BE(Hons) and PhD in Electrical Engineering from The University of Western Australia in 1982 and 1991 respectively. Prior to joining AUT, he was with the School of Engineering and Advanced Technology at Massey University from 2006. He had also held various academic positions in the School of Computer Engineering at Nanyang Technological University in Singapore, School of Engineering with Edith Cowan University in Western Australia, and

Department of Information Engineering at the Chinese University of Hong Kong. He had also worked as a independent consultant, developing industrial training courses and optimization software for the mining industry in Australia. His general research interests include multimedia signal processing, machine learning techniques, wireless networks and information theory.

Keynote Lecture: The Concept of Consistent Resampling Theory for Non-bandlimited Signals And Its Applications

Sampling theory deals with the conversion of analog signals to digital samples. In many applications, there is a need to resample digital signals. This process requires the digital signal to be first reconstructed as a continuous signal before resampling. Current theory assumes this continuous signal to be bandlimited. A new theory, known as consistent resampling, has been proposed by the author which does not have this band-limitation requirement. In this talk, the consistent resampling theory is introduced. It is then illustrated through applications to image resizing, and to the detection of Pilot Symbol Assisted Modulation (PSAM) which is a noisy resampling problem. In the later case, the mobile channel is estimated from the noise corrupted data sequence and resampled so that the transmitted data can be recovered.



Prof. Ce Zhu

University of Electronic Science and Technology of China, China

Biography: Ce Zhu is currently a Professor with the School of Information and Communication Engineering, University of Electronic Science and Technology of China, Chengdu, China. His research interests include image/video coding and communications, 3D video, visual analysis and understanding, visual perception and applications. He has served on the editorial boards of a few journals, including as an Associate Editor of IEEE Transactions on Image Processing, IEEE Transactions on Circuits and Systems

for Video Technology, IEEE Transactions on Broadcasting, IEEE Signal Processing Letters, and IEEE Communications Surveys and Tutorials. He has also served as a Guest Editor of a few special issues in international journals, including as a Guest Editor in the IEEE Journal of Selected Topics in Signal Processing. He is a Fellow of the IEEE, and an IEEE CASS Distinguished Lecturer (2019-2020).

Keynote Lecture: Rate Distortion Optimization in Video Coding: from Local to Global

The task of video coding is to maximize rate-distortion performance, i.e., to minimize the coding distortion subject to a rate constraint, by means of rate-distortion optimization (RDO). When coding a video sequence by performing the sequential coding procedure on a great number of partitioned

coding units of strong spatial or temporal dependency (due to the extensive use of spatial/temporal prediction and context-based coding/processing), a globally optimal solution is extremely hard to be obtained in an operational way, as such dependency poses a great challenge to perform a global or dependent RDO in such a sequential coding procedure. In practice, RDO has to be performed for each coding unit independently, and a locally suboptimal solution is obtained instead which is far from optimal one as it ignores the strong spatial or temporal dependency among the coding blocks or frames. For decades, the global or dependent RDO problem has been challenging, especially for a one-pass coding.

This talk intends to discuss the RDO fundamentals, state-of-the-art techniques, and the challenges of performing dependent RDO. In particular, recent operational dependent RDO schemes are to be elaborated to stimulate more significant work on the development of dependent RDO. Our most recent work on top of the Versatile Video Coding (VVC) standard will also be presented.

Invited Speakers



Assoc. Prof. Han Zhang
Sichuan University, China

Biography: Han Zhang, Ph.D. in Optical Science, Associate Professor, Master's tutor. Excellent Talent of Sichuan and Chengdu Talents Plan, evaluation expert of Chengdu Science and Technology. Received the B.S. degree in physics from University of Science and Technology of China, and the Ph.D. degree from University of Arizona, America. Teaching in Sichuan University since 2016. Earlier worked for international well-known biomedical equipment technology companies, with more than ten years research and innovation experience in biomedical equipment field.

He has long been engaged in basic and applied research in biomedical optics, super-resolution imaging technology, molecular diagnostic instruments, mid infrared fiber lasers, etc. He has authored/co-authored more than 20 papers at international journals retrieved by SCI, and invented more than 20 patents. He has presided many national and provincial projects, such as National Natural Science Foundation of China, key R&D programs of Ministry of science and technology, key projects of Ministry of human resources and social security, major projects of Sichuan Province, etc.

Invited Lecture: The Automation and Intelligence Revolution of Molecular diagnostics

Molecular diagnostics is a technology using molecular biological methods to provide information and basis for disease prevention, diagnosis and treatment by detecting the change of structure or content of genetic material in organism. Molecular diagnostics has become one of the fastest growing fields of IVD, which can be detected from the gene level with high detection sensitivity and accuracy. Molecular diagnostics mainly includes gene sequencing, PCR/QPCR, molecular hybridization, nucleic acid mass spectrometry, among which the molecular diagnostics products based on PCR/QPCR platform have the advantages of high sensitivity, strong specificity, fast and convenient and are widely used in infectious disease pathogen detection, genetic disease gene detection, molecular assisted breeding and other fields. At present, the mainstream molecular diagnostics system in the market is generally composed of several independent products. Each step of experimental operation needs to be completed independently in a strictly divided standard molecular biology laboratory, with low automation, complex diagnosis process and low diagnosis efficiency, which brings great inconvenience to the inspectors. Automatic molecular diagnostics technology is the only way to improve the efficiency and accuracy of diagnosis and treatment, reduce the cost of diagnosis, and will provide a good opportunity for the rapid development of molecular diagnostics industry in China.



Prof. Yiyu Cai
Nanyang Technological University (NTU), Singapore

Biography: Professor Yiyu Cai is a tenured faculty with Nanyang Technological University (NTU), Singapore. In NTU, he heads the Computer-aided Engineering Labs, and directs the Strategic Research Program of VR & Soft Computing. He is also deputy director of NTU's Center of Augmented & Virtual Reality. Currently, he is leading a team in NTU developing Virtual & Augmented Reality Technology to enhance learning.

He has over 20 years' experience doing R&D in Virtual & Augmented Reality, Simulation & Serious Games, Artificial Intelligence, and their applications in medicine, engineering and education. His research has been supported by Singapore's National Research Foundation, Temasek Trust Funded Singapore Millennium Foundation, Ministry of Education, and many other public and private sectors. He has co-invented 6 international patents, and published 5 books (Springer) and over 100 technical articles in SCI/SSCI journals and leading international conferences. He has organised more than 20 international conferences and will organise the prestigious AI medical conference MICCAI2022 in Singapore. He has given near 60 keynote or invited speeches in 20+ countries including France, Hollands, and Japan. He was former president of International Simulation and Gaming Association which was founded in Europe 50 years ago. Over the years, he has been working closely with world class scientists and educators from Johns Hopkins Medical School (USA), University of Toronto (Canada), University College London (UK) and Utrecht University (The Netherlands).

Invited Lecture: Point Cloud Processing and Applications

In this talk, I will share the recent research and development in Nanyang Technological University on point cloud processing from multi-modal imaging. Applications in construction, particularly Building Information Modeling will be discussed.

Prof. Jun Cheng

UBTech Research Institute, Shenzhen, China



Biography: Jun Cheng received the B. E. degree in electronic engineering and information science from the University of Science and Technology of China, and the Ph. D. degree in electrical and electronic engineering from Nanyang Technological University, Singapore. In 2009, he joined the Institute for Infocomm Research, Agency of Science, Technology and Research (A*STAR), Singapore. Earlier, he worked for more than two years with Panasonic Singapore Laboratories.

He is now Deputy Director of UBTech Research Institute, Shenzhen, China. He was a senior scientist and the research lead in the Intelligent Medical Imaging (iMED) department in the Institute for Infocomm Research, leading the research of medical image processing & understanding. He has developed many algorithms for automated ocular disease detection including glaucoma, age-related macular degeneration, pathological myopia. He has received the IES Prestigious Engineering Achievement Award 2013. His research interests include computer vision, image processing, medical imaging and machine learning. He has authored/co-authored many publications at prestigious journals/conferences, such as TMI, TIP, TBME, IOVS, JAMIA, MICCAI, CVPR and invented more than 10 patents. He serves as reviewers for many journal and conferences. He is currently associate editor for TMI.

Invited Lecture: Noise Adaptation Generative Adversarial Network for Medical Image Analysis

Machine learning has been widely used in medical image analysis under an assumption that the training and test data are under the same feature distributions. However, medical images from difference devices or the same device with different parameter settings are often contaminated with different amount and types of noises, which violate the above assumption. Therefore, the models trained using data from one device or setting often fail to work for that from another. Moreover, it is very expensive and tedious to label data and re-train models for all different devices or settings. To overcome this noise adaptation issue, it is necessary to leverage on the models trained with data from one device or setting for new data. In this work, we reformulate this noise adaptation task as

an image-to-image translation task such that the noise patterns from the test data are modified to be similar to those from the training data while the contents of the data are unchanged. We propose a novel Noise Adaptation Generative Adversarial Network (NAGAN), which contains a generator and two discriminators. The generator aims to map the data from source domain to target domain. Among the two discriminators, one discriminator enforces the generated images to have the same noise patterns as those from the target domain, and the second discriminator enforces the content to be preserved in the generated images. We apply the proposed NAGAN on both optical coherence tomography (OCT) images and ultrasound images. Results show that the method is able to translate the noise style. In addition, we also evaluate our proposed method with segmentation task in OCT and classification task in ultrasound. The experimental results show that the proposed NAGAN improves the analysis outcome.

PROGRAMME OVERVIEW

Day 1-Nov.13, 2020 Beijing Time, GMT+8 Friday		
14:00-17:00	Offline 线下签到注册 Lobby # Xiangyu Hotel	
Day 2-Nov.14, 2020 Beijing Time, GMT+8 Saturday		
Online 线上签到注册  (Sign-up through the QR Code within Nov.14, 2020 (识别二维码完成线上签到) (有效期 11 月 14 日))	Keynote Speech 9:00-11:50 Room 1 ID: 932 724 194	
	9:00-9:30	Opening Ceremony & Group Photo
	9:30-10:10	Keynote Lecture Prof. Hao Ying
	10:10-10:50	Keynote Lecture Prof. Edmund Lai
	10:50-11:10	Coffee Break
	11:10-11:50	Keynote Lecture Prof. Ce Zhu
	11:50-13:30	Lunch
Track 1: Communication, Image and Signal Processing (Off-line) 13:30-17:00 Room 1 ID: 932 724 194		Track 2: Emerging Technologies in Image and Signal Processing (On-line) 13:30-17:00 Room 2 ID: 365 531 903
13:30-14:00	Invited Lecture Assoc. Prof. Han Zhang	Invited Lecture Prof. Yiyu Cai
14:00-14:30	Technical Session 1(A)	Invited Lecture Prof. Jun Cheng
14:30-15:30	Technical Session 1(A)	Technical Session 2(A)
15:30-15:35	Coffee Break	Break
15:35-15:50		Technical Session 2(B)
15:50-16:50	Technical Session 1(B)	Technical Session 2(B)



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16:50-17:20	Poster Session
17:20-17:30	Closing Ceremony
Day 3-Nov.15, 2020 Beijing Time, GMT+8 Sunday	
8:00-11:30	Half-day Tour (Pending)

INSTRUCTIONS TO PRESENTATIONS

Oral Presentation

1. File format: MS-PowerPoint (*.ppt) or Adobe PDF (*.pdf)
2. Time: About 15mins, including Q/A time.
3. Language: English
4. Fonts: Arial or Times New Roman
5. Dress code: Formal clothes
6. Facility: Presenters need to use own laptop, please notify conference secretary via e-mail in advance and test the connection before session start.
7. Online conference software: Tencent VooV

Poster Presentation

1. Poster Size: 1m*0.8m (height*width).
2. Language: English.
3. Poster format: jpg
4. The poster should include: Paper ID, Conference Name's Acronym, Significance of the research, the methods used, the main results obtained, and conclusions drawn.
5. Posters are required to be condensed and attractive.
6. The conference organizer won't send/keep any posters after the conference.

NOTICE:

- Certificate of Participation will be awarded after the conference finished via fast delivery.
- One best presentation will be selected from each session. The best one will be announced when each session ends, and will be awarded with a "Best Presentation" certificate.

Online Video Conference Operation Guide via VooV

● (Conference Information):

Time	Room	Topics/Contents	Conference ID	Conference Link
9:00-11:50 Nov. 14, Beijing time	Room 1	Opening ceremony and Keynote Session	932 724 194	https://meeting.tencent.com/s/zwcBw5hczmoZ
13:30-17:30 Nov. 14, Beijing time	Room 1	Communication, Image and Signal Processing	932 724 194	https://meeting.tencent.com/s/zwcBw5hczmoZ
13:30-17:30 Nov. 14, Beijing time	Room 2	Emerging Technologies in Image and Signal Processing	365 531 903	https://meeting.tencent.com/s/JVMHfK9YsxwO

● Testing:

All the participants can join the conference room during the testing time, the conference secretary will arrange the participants who will do the oral presentation to test one by one.

Testing Time	Room ID	Participate	Testing ID	Testing Link
9:30-10:30 a.m Nov. 09, 2020 (Beijing Time)	Room 1	Speakers	932 724 194	https://meeting.tencent.com/s/zwcBw5hczmoZ
10:30-11:30 a.m Nov. 09, 2020 (Beijing Time)	Room 2	Speakers	365 531 903	https://meeting.tencent.com/s/JVMHfK9YsxwO
14:30-16:00 p.m Nov.10, 2020 (Beijing Time)	Room 1	Oral speakers in Track 1	932 724 194	https://meeting.tencent.com/s/zwcBw5hczmoZ
	Room 2	Oral speakers in Track 2	365 531 903	https://meeting.tencent.com/s/JVMHfK9YsxwO

● Operation Guide:

1. Video meeting software): VooV

Download link:

A.) Chinese Version

<https://meeting.tencent.com/download-mac.html?from=1001&fromSource=1> (Mac OS)

<https://meeting.tencent.com/download-win.html?from=1001&fromSource=1> (Windows)

B.) International Version

<https://voovmeeting.com/download/darwin> (Mac OS)

<https://voovmeeting.com/download/windows> (Windows)

2. Join the Conference:

Method 1: Click the Conference link, or click “Join the conference”, then input the Conference ID. When you join the conference room, you need to fill in your phone number for authentication, then fill in your “Paper ID +Name” at the “Name” to join the conference.

*Tip: Should you fail to “Join the Conference” as a visitor, we suggest you register an account by method 2, then log in and join the conference.

Method 2: You can register at the APP/ website (<https://www.voovmeeting.com/>), log in and join the conference by the link or tap the Conference ID.

● Note

- The conference committee will **call the roll 5 minutes before** our conference, please join the conference in advance for at least 5 minutes. The conference secretaries will be waiting since 8:30.
- Please **wear headphones** during the meeting to block out the outside noise. Keeping the video on and keeping online are suggested.
- Please test the video meeting software in advance.
- During the poster session, we will upload all the poster files in the “meeting room”. For learning more about posters, you could download the files to read only. But please note that, all materials have not been published, please **respect the paper originality and copyright**.

*Note: Since International version does not support the function of file transmission, we recommend you to download Chinese version, then you can upload and download file smoothly. If Chinese version is not available in your country or region, you can download International version; as for e-posters, we could email you via email box once you requested.

- Please follow WeChat for Consultation (**APISE17358663189**) for more information. CCISP 2020 Wechat Group will update conference information in realtime.
- Should you have any further questions about this operation guide, please click <https://www.voovmeeting.com/> for help. You can also contact the conference secretary at +86-17723329879(China), +852-30506939 (Hong Kong).

TECHNICAL SESSION

<p align="center">Keynote Speech Session Chair: Prof. Jing Zhang (Sichuan University, China) 9:30-11:50, Nov.14, 2020 Saturday Xiangtai Hall, 2nd Floor & On-line Room 1 ID: 932 724 194</p>			
Time	No.	Content	Page
9:30-10:10	KN1	Predicting Unintentional Vehicle Lane Departure Using Support Vector Machine and Neural Network <i>Prof. Hao Ying</i> , Wayne State University, USA	3
10:10-10:50	KN2	The Concept of Consistent Resampling Theory for Non-bandlimited Signals And Its Applications <i>Prof. Edmund Lai</i> , Auckland University of Technology, New Zealand	4
10:50-11:10	Coffee Break		
11:10-11:50	KN3	Rate Distortion Optimization in Video Coding: from Local to Global <i>Prof. Ce Zhu</i> , University of Electronic Science and Technology of China, China	4
11:50-13:30	Lunch		
<p align="center">Track 1: Technical Session 1: Communication, Image and Signal Processing Session Chair: Prof. Qi Zeng (Sichuan University, China) 13:30-17:30, Nov.14, 2020 Saturday Xiangtai Hall, 2nd Floor & On-line Room 1 ID: 932 724 194</p>			
Track 1: Technical Session 1 (A)			
13:30-14:00	IS1	The Automation and Intelligence Revolution of Molecular diagnostics <i>Assoc. Prof. Han Zhang</i> , Sichuan University, China	6
14:00-14:15	C036	Analysis of Probabilistic Hopping Pattern in FHMA Systems over Contaminated Channels <i>Yue Zhao</i> , Science and Technology on Communication Security Laboratory (No. 30 Research Institute of China, Electronics Technology Group Co.), China	22

14:15-14:30	C084	Design of online open channel flow monitoring system based on LSPIV <i>Xincheng Liu</i> , University of Electronic Science and Technology of China, China	22
14:30-14:45	C095	Geometrical Features based Visual Relocalization for Indoor Service Robot <i>Jikai Wang</i> , University of Science & Technology of China, China	23
14:45-15:00	C014	Automatic calcaneus fracture identification and segmentation using a multi-task U-Net <i>Yuxuan Mu</i> , Beijing Institute of Technology, China	23
15:00-15:15	C077	Upper Bound on the Number of Full Cycle Codewords of Cyclic Codes <i>Xing Liu</i> , Sichuan University, China	23
15:15-15:30	C079	A Novel Construction Technology of Enterprise Business Deployment Architecture Based on Containerized Microservices <i>Ruiqi Zeng</i> , Science and Technology on Communication Security Laboratory, China	24
15:30-15:50	Coffee Break		
Track 1: Technical Session 1 (B)			
15:50-16:05	C082	Study on the Emotional Image of Calligraphy Strokes based on Sentiment Analysis <i>Ruimin Lyu</i> , Jiangnan University, China	24
16:05-16:20	C087	Style Evaluation of Chinese Fonts with applications <i>Ruimin Lyu</i> , Jiangnan University, China	24
16:20-16:35	C086	SARANIQA: Self-Attention Restorative Adversarial Network for No-Reference Image Quality Assessment <i>Siyu Xue</i> , Northwest University, China	25
16:35-16:50	C093	A refined prior-box generator for anchor-based object detector <i>Hao Zhao</i> , University of Science and Technology of China (USTC), China	25
16:50-17:20	Poster Session		
17:20-17:30	Closing Ceremony		

Track 2: Technical Session 2: Emerging Technologies in Image and Signal Processing

Session Chair: Prof. Pengjiang Qian (Jiangnan University, China)

13:30-17:30, Nov.14, 2020 Saturday

On-line Room 2 ID: 365 531 903

Track 2: Technical Session 2 (A)

13:30-14:00	IS2	Point Cloud Processing and Applications <i>Prof. Yiyu Cai</i> , Nanyang Technological University (NTU), Singapore	6
14:00-14:30	IS3	Noise Adaptation Generative Adversarial Network for Medical Image Analysis <i>Prof. Jun Cheng</i> , UBTech Research Institute, Shenzhen, China	7
14:30-14:45	C011 (Video)	An application recommendation method based on IUF <i>Yanqin Wu</i> , Research Institute of China Telecom Corporation Limited, China	26
14:45-15:00	C005	Satellite Fusion Positioning Algorithm Based on GDOP <i>Siyu Ju</i> , Beijing Institute of Technology, China	26
15:00-15:15	C020	Surface damage detection method for blade of wind turbine based on image segmentation <i>Bin Hu</i> , China Special Equipment Inspection and Research Institute, China	26
15:15-15:30	C028	An image stitching method for blades of wind turbine based on background removal preprocessing <i>Weibin Li</i> , Computation Aerodynamics Institute, China Aerodynamics Research and Development Center, China	27
15:30-15:35	Break		
Track 2: Technical Session 2 (B)			
15:35-15:50	C031 (Video)	LDA Based on Real-time Classification of CCTV Systems Using Codeblocks Information <i>Abdou Khadre DIOP</i> , ICT Department at the Alioune DIOP University, Senegal	27

15:50-16:05	C047	Para-sagittal Midclavicular Plane Localization in 3DCT Using Multi-Agent Dueling Network <i>Yi Li</i> , Southeast University, China	28
16:05-16:20	C068	Research and Design of Moving Target Detection and Tracking System Based on Web Server <i>Jianhui Gao</i> , Fuzhou University, China	28
16:20-16:35	C089	A Model-Driven Stack-Based Fully Convolutional Network for Pancreas Segmentation <i>Hao Li</i> , Shanghai Jiao Tong University, China	28
16:35-16:50	C090	Detection and Classification of Pneumonia from Lung Ultrasound Images <i>Chng Chin Boon</i> , National University Of Singapore, Singapore	29
16:50-17:20	Poster Session		
17:20-17:30	Closing Ceremony		

Poster Session

Chair: Xue-Qin Jiang (Donghua University, China)

and M.A.Jabbar (Vardhaman college of Engineering Hyderabad, India)

16:50-17:20, Nov.14, 2020 Saturday || Xiangtai Hall, 2nd Floor & On-line Room

1 ID: 932 724 194 & On-line Room 2 ID: 365 531 903

C003	Life Signal Detection Based on Singular Spectrum Analysis in the Terahertz Band <i>Zhengyang Yu</i> , Xidian University, China
C007	Vital Signs Detection Based On Millimeter Wave Radar <i>Honghui Li</i> , Zhejiang Ocean University, China
C008	Is oam a better transmission method than mimo scheme? <i>Hantang Liuli</i> , Southeast University, China
C009	A Low-Cost Switchable Circularly-Polarized Transmit 1024-Element Phased Array for Ka-Band SATCOM <i>Xuan Luo</i> , University of Electronic Science and Technology of China (UESTC), China
C012	Study of NLMS algorithm used in the cancellation of navigation interference in the HI observation <i>LI Shuang-xun</i> , National University of Defense Technology, China
C015	Pedestrian detection based on attention mechanism and feature enhancement with SSD <i>Ting Ting Feng</i> , Donghua University, China
C016	Deep Learning Based Parallel Detector for MIMO Systems <i>Xue-Qin Jiang</i> , Donghua University, China
C017	GIS Insulation Defect Diagnosis Method Based on Improved MFCC and PCA-SVM Model <i>Binbin Li</i> , State Grid Electric Power Research Institute of Anhui Electric Power Co., LTD, China
C018	High Efficiency Continuous-Variable Quantum Key Distribution Based on Quasi-Cyclic LDPC codes <i>Xue-Qin Jiang</i> , Donghua University, China
C019	Design of Intelligent Monitoring and Control System Based on Modbus <i>Geng Yue</i> , Beijing University of Posts and Telecommunications, China
C022	Dynamic obstacle avoidance path planning of UAV Based on improved APF <i>Li Keyu</i> , Shanghai Institute of Electrical Engineering, China

C023	Serial interference cancellation power control algorithm based on non-cooperative game theory <i>Miao Li</i> , Northwest Normal University, China
C025	MIMO Detection Algorithms and Architectures <i>Houzuo Liu</i> , Xidian University, China
C027	Classification of the Mask Augsburg Speech Corpus (MASC) Using the Consistency Learning Method <i>Dezhi Wang</i> , National University of Defense Technology, China
C030	A SAR Image Segmentation Method Based on MLRT <i>Yanwei Ju</i> , Nanjing Research Institute of Electronics Technology, China
C032	Joint Regularized-based Image Reconstruction by Combining Super-Resolution Sinogram for Computed Tomography Imaging <i>Chao Tang</i> , PLA Strategic Support Force Information Engineering University, China
C035	Statistical Modeling of ISAR Imaging based on Bayesian Compressive Sensing of Pareto Distribution Family <i>Chaoyu Xia</i> , The 2-nd Research Institute, Civil Aviation Administration of China, China
C037	Echo Highlight Model of Underwater Target and Design of FPGA Signal Simulation Module <i>Hu Chen</i> , Science and Technology on Underwater Test and Control Laboratory, China
C038	Lung CT image aided detection COVID-19 based on Alexnet network <i>Tao Wang</i> , Qilu University of Technology (Shandong Academy of Sciences) Institute of automation, Shandong Academy of Sciences Shandong Provincial Key Laboratory of Robot and Manufacturing Automation Technology
C040	Research on Energy-saving Collaborative Optimization Method for Multiple Trains Considering Renewable Energy Utilization <i>Ly Jieli</i> , Lanzhou Jiao tong University, China
C044	Evaluation of Regional Economic Development Level in Fujian Province Based on Principal Component Analysis <i>Lifeng Wu</i> , Jimei University, China
C045	An Effective Method for CHF Diagnosis via Attention-based RNN Using ECG Signals <i>Ming Xia</i> , Tsinghua Shenzhen International Graduate School, China
C046	Rapid Ship Detection in SAR Images Based on YOLOv3 <i>Mingming Zhu</i> , Air Force Engineering University, China
C050	Automatic Radio Map Adaptation for WiFi Positioning Systems <i>Xin Chen</i> , Xiamen University, China

C051	A Method for the Global Photographic Clarity based on Multifocal Pre-treatment of Partitioned View <i>Juan Du</i> , New Research and Development Center of Hisense, Qingdao, China
C053	Prediction of online consumers' buying behavior based on LSTM-RF model <i>Yuxue Shi</i> , Harbin University of Commerce, China
C054	Commodity sales forecast based on ARIMA model residual optimization <i>Xinchao Zhang</i> , Harbin University of Commerce, China
C056	Forecasting Model of High Transfer Stock —— Based on Integrated Learning <i>Yi Tao</i> , Zhejiang Gongshang University, China
C057	Study on the characteristics of dolphins click signal <i>Zhang Zhaoxue</i> , Science and Technology on Underwater Test and Control Laboratory, China
C058	Experimental Study on Forward Acoustic Scattering in Stratified Water Turbulence <i>Jintao Yong</i> , Science and Technology on Underwater Test and Control Laboratory, China
C059	Research on Parallel System for Motion States Monitoring of the Planetary Rover <i>Sun Shuai</i> , Beijing Institute of Control Engineering, China
C066	Contrastive Study of Distributed Multitask Fuzzy C-means Clustering and Traditional Clustering Algorithms <i>Yanlin Guo</i> , Jiangnan University, China
C069	The Study on Inversion of Wave Equation Based on Adaptive Homotopic Regularization Method <i>Jingying Wang</i> , Science and Technology on Underwater Test and Control Laboratory, China
C076	Research on Test Platform of Train Control Vehicle-mounted Subsystem for High-speed Railway <i>Qi Fanrui</i> , Lanzhou Jiao tong University, China
C080	Optimal design of emission waveform for acoustic scattering test under multipath interference <i>Jianglin Wu</i> , Science and Technology on Underwater Test and Control Laboratory, China
C085	Rectificatory Semantic Information Supplement Network(RSIS-net) For Dynamic Scene Deblurring <i>Duqiang Luo</i> , Hebei University, China
C088	Design of refined segmentation model for underwater images <i>Haofei Li</i> , Xidian University, China
C092	On the Information Application of Multimedia Technology in Museum <i>Yuting Luo</i> , Hunan Normal University, China

C097	The Effectiveness of Airborne Lidar in The Evaluation of Denoising Algorithm for Spaceborne Photon-counting data <i>Yaming Nan</i> , University of Electronic Science and Technology of China, China
C098	Research on the Design and Marketing Platform of Changsha Kiln Ceramic Products <i>Yuqing Luo</i> , Hunan Normal University, China
C099	Design of AES/EBU Audio Transceiver System Based on FPGA <i>Zhao Yi-Fan</i> , Communication University of China, China

ABSTRACT INDEX

Technical Session 1	
Time	Content
14:00-14:15	<p>C036: Analysis of Probabilistic Hopping Pattern in FHMA Systems over Contaminated Channels</p> <p>Presenter: <i>Yue Zhao</i>, Science and Technology on Communication Security Laboratory (No. 30 Research Institute of China, Electronics Technology Group Co.), China</p> <p>Abstract: The frequency-hopping system with MFSK modulation (MFSK/FH) is a classic solution to combating the contaminated channels. To improve the performance of MFSK/FH system in the presence of the strong fading, we will focus on a so-called probabilistic FH (PFH) pattern to reduce the attenuation impact in this paper. The PFH pattern possesses different usage probabilities of frequency slots based on the channels qualities. Then, we utilize the PFH pattern into the asynchronous MFSK/FH multi-access (MFSK/FHMA) system. The signal processing and the decision variable are derived. Finally, The performance of MFSK/FHMA system with PFH set is evaluated over the fading channel. From the results, it is found that the proposed system can improve the performance compared with other FH systems with the traditional hopping patterns as there exist some of strong fading channels.</p>
14:15-14:30	<p>C084: Design of online open channel flow monitoring system based on LSPIV</p> <p>Presenter: <i>Xincheng Liu</i>, University of Electronic Science and Technology of China, China</p> <p>Abstract: With the change of global climate in recent years, the risk and harm of flood disasters are gradually increasing. Long-term monitoring for prediction and assessment of them open channels is very necessary. Nowadays, hydropower stations often bear more flood discharge costs to help the downstream avoid risks, but there is a lack of a scientific method to evaluate the cost of flood discharge. Large-scale particle image velocity (LSPIV) has qualified for flood prevention, assessment, and the potential of hydropower station water flow measurement, because now the demand is increasing and the existing open channel measurement techniques, such as Acoustic Doppler current profiler (ADCP) cannot be successfully completed survey work in the flood condition. And the development of LSPIV is rapid. The integration technology and calibration method of LSPIV equipment are rapidly evolving, such as fixed LSPIV, LSPIV with unmanned aerial vehicle (UAV) system, tracer particles of environmental protection materials and unseeded LSPIV, which have been described in typical articles in the past 20 years in this paper. And this paper gives an overview of them. Based on the above, we design an online flow velocity monitoring system of LSPIV that is easy to install, low power consumption, high cost performance and wide application range. Our research will be carried out from three aspects: hardware design, software algorithm and calibration method. Moreover, this scheme will be compared and analyzed with existing schemes in the paper, so as to appear the advantages and disadvantages of LSPIV and put forward a reasonable prospect.</p>

14:30-14:45	<p>C095: Geometrical Features based Visual Relocalization for Indoor Service Robot Presenter: <i>Jikai Wang</i>, University of Science & Technology of China, China</p> <p>Abstract: In traditional SLAM methods, the environment map is the simply assembled points or lines, which makes it difficult to directly perform relocalization using such map. This paper presents a new implementation method for indoor environment representation and visual relocalization using RGB-D sensor. The method is developed for indoor service robots to perform relocalization using the observed point and line features. In this paper, the sparse feature map, line segment map, and dense point cloud map of an environment are learned by a random forest to regress the correspondences between visual features and 3D world locations, geometrical features and 3D world locations. Using the learned forest, landmark positions are efficiently predicted and the camera poses are then estimated in a probabilistic framework. The performance of the proposed method is demonstrated under various challenging environments using public benchmark dataset and our own dataset collected in an office environment. These conditions contain ambiguous areas, long corridor, moving people, viewpoint changes, or illumination variation. The proposed method is thoroughly evaluated against several strong state-of-the-art baselines. Experimental results prove the efficacy of our method.</p>
14:45-15:00	<p>C014: Automatic calcaneus fracture identification and segmentation using a multi-task U-Net Presenter: <i>Yuxuan Mu</i>, Beijing Institute of Technology, China</p> <p>Abstract: Calcaneus is the bone in the foot that bears most of the body weight and calcaneus fracture is the most common type of tarsal bone fractures. Plain radiograph examination is usually the first step of calcaneus fracture diagnosis because of its convenience and low cost. A multi-task U-Net is proposed in this paper to develop a computer aided calcaneus fracture diagnosis system. Our approach is an end-to-end CNN for identification and segmentation of calcaneus fracture, which uses regularization of the two tasks for mutual performance enhancement. First, a novel radiograph normalization method to obtain scale rotation invariance under different monochrome type is employed. Second, a classification header with feature from decoder and encoder is added to U-Net for multitask. Finally, a conditional dice-loss which can promote model performance under rough-ground-truth supervision is adopted in training. Experiments show that the network predicts fracture regions more precise than the rough ground-truth and identifies fracture with sensitivity of 99.53% and specificity of 98.59%.</p>
15:00-15:15	<p>C077: Upper Bound on the Number of Full Cycle Codewords of Cyclic Codes Presenter: <i>Xing Liu</i>, Sichuan University, China</p> <p>Abstract: In this paper, we first derive an upper bound on the number of full cycle codewords of a cyclic code. Then we study the numbers of full cycle codewords of two classes of cyclic codes, one is Reed-Solomon code and the other is general cyclic code. For Reed-Solomon code, we get the number of its full cycle codewords. Further, we present a condition under which the Reed-Solomon code has (near) maximum number of full cycle codewords. For general cyclic code, we also get a condition under which it has maximum number of full cycle codewords.</p>

15:15-15:30	<p>C079: A Novel Construction Technology of Enterprise Business Deployment Architecture Based on Containerized Microservices</p> <p>Presenter: <i>Ruiqi Zeng</i>, Science and Technology on Communication Security Laboratory, China</p> <p>Abstract: With the rise of microservices, containerized deployment has gradually become the main deployment method for applications. It can support our software infrastructure and achieve efficient management of scalable applications and services. Although there are many studies on containerized applications in software deployment, there are few researches on related comprehensive solutions in other aspects of software lifecycle management in enterprises, such as code management, operation and maintenance, and third-party system integration. This paper takes company's business deployment architecture as the research object, and designs a comprehensive system construction plan. In this paper we describe the overall plan, and separately design the service deployment platform subsystem, system operation and maintenance subsystem, code management subsystem, and third-party integration subsystem. At the software level, we describe the business architecture and explain how the application software provides external services. Meanwhile, in order to verify the actual situation of the system deployment, a test module was designed to verify the actual system deployment. This comprehensive solution can satisfy the enterprise's integrated management of the software life cycle.</p>
15:50-16:05	<p>C082: Study on the Emotional Image of Calligraphy Strokes based on Sentiment Analysis</p> <p>Presenter: <i>Ruimin Lyu</i>, Jiangnan University, China</p> <p>Abstract: Calligraphy is usually regarded as the art of handwriting lines, because calligraphic strokes can express rich affective information and trigger rich imaginations. Traditional calligraphy theory and modern aesthetics discussed much on this topic, but are mostly based on personal experience, and thus we can't know how the public feel about calligraphic strokes. This study proposes an educational experiment integrating aesthetic and science and engineering to explore the emotional image of calligraphy strokes, which has the dual value of research and teaching. The experiment requires every participant to fully feel and imagine based on the chosen calligraphic strokes, and to freely choose a theme and write an article. Finally, we apply sentiment analysis on all the articles, do quantitative analysis and data visualization, and thus show the rich subjective image of the typical strokes of twelve famous historical calligraphers.</p>
16:05-16:20	<p>C087: Style Evaluation of Chinese Fonts with applications</p> <p>Presenter: <i>Ruimin Lyu</i>, Jiangnan University, China</p> <p>Abstract: Aesthetic evaluation is an important part of Chinese font design and generation, but there is still a lack of scientific calculation model for effective aesthetic and style evaluation of fonts. In this paper, a method of font evaluation based on experimental aesthetics is proposed and applied to the visual evaluation and retrieval development of printed fonts. Firstly, the commonly used computer font database is selected to generate the research font map; secondly, the aesthetic scale is compiled to recruit the subjects to evaluate the aesthetic of the printed characters of the scale; finally, the collected evaluation data are collected to</p>

	<p>analyze the characteristics of each font. The results showed that there was no significant difference in aesthetic feeling among the printing fonts, but there were significant differences in styles. A retrieval system designed by using style coefficient also has the practicability of font recommendation. This evaluation method can be applied to the research of similar fonts, and further expand the font data onto the recommendation system.</p>
16:20-16:35	<p>C086: SARANIQA: Self-Attention Restorative Adversarial Network for No-Reference Image Quality Assessment Presenter: <i>Siyu Xue</i>, Northwest University, China</p> <p>Abstract: In this work, we propose a self-attention restorative adversarial net (SARAN), a GAN-based model for no-reference image quality assessment (NR-IQA). Consistent with the human visual system, we add the self-attention module and improve the model structure to enhance the intensity of the against learning, the generated reference image for evaluation also could be more reliable. SARAN is composed of three parts: a generative network, a discriminative network and a quality evaluation network. The generative network performs feature extraction and reconstruction of the input distorted image patches, while the discriminative network distinguishes the reconstructed patches from the pristine distortion-free patches. In order to capture the long range dependence which is beneficial to enhance the key texture and structure features of an image, the self-attention module is added into network. After restoration, the perceived distance between the restored and distorted patches is defined as appreciation of restoration (AoR). In the quality evaluation network, features vectors are concatenated from the distorted and restored patches, AoR. Eventually, the quality score of an input image is estimated by weighted sum of the patches scores. Experimental results are carried out on the LIVE and TID2013 datasets, SARAN is superior to the mainstream methods in the no-reference image quality assessment and has good performance for different distortion types. Meanwhile, it is more consistent with the human visual system (HVS) for no-reference image quality assessment.</p>
16:35-16:50	<p>C093: A refined prior-box generator for anchor-based object detector Presenter: <i>Hao Zhao</i>, University of Science and Technology of China (USTC), China</p> <p>Abstract: This paper proposes a refined prior-box generator for anchor-based object detectors, which allows detectors to be trained on a more balanced candidate set. Concretely, we present two schemes to alleviate the sample imbalance caused by prior-box mechanism. First, a more elaborated presupposed dimension calculation scheme is introduced to obtain more positive samples. Then, a location weighting mask originating from the edge map is constructed to guide the sampling of prior-box, which has the ability to avoid sampling in the background as much as possible. The widely used Feature Fusion Single Shot multi-box Detector (FSSD) is selected as baseline. Extensive experiments are conducted on the Pascal VOC (07+12) dataset and demonstrate that FSSD with the refined prior-box generator achieves 1.3% higher mean Average Precision (mAP) with 70% fewer prior candidate bounding boxes. Under the same input resolution, our method receives the best detection performance.</p>

Technical Session 2	
14:30-14:45 (Video)	<p>C011: An application recommendation method based on IUF</p> <p>Presenter: <i>Yanqin Wu</i>, Research Institute of China Telecom Corporation Limited, China</p> <p>Abstract: The application of intelligent terminal comes into being brings great convenience to the work and life of people. In order to facilitate the user to find the desired application quickly, it is necessary to provide a solution implemented. Referring to RFM model, an application recommendation method based on IUF model is proposed in this paper. This method can calculate the user's recommendation rate for an application by combining the user's most recent average time interval, number of uses and network traffic value based on standardized formula. Based on the result of recommendation rate, the application apps which never installed by user can be recommended to them. The experimental results show that the method can judge the application category of the user's favorite effectively, and determine the application to be recommended more accurately and reasonably. And through evaluated by comparison with other indicators, the accuracy, recall rate and F value are over 14% higher than the recommended method based on a single indicator, which proved the effectiveness of this method.</p>
14:45-15:00	<p>C005: Satellite Fusion Positioning Algorithm Based on GDOP</p> <p>Presenter: <i>Siyu Ju</i>, Beijing Institute of Technology, China</p> <p>Abstract: In passive satellite positioning, different positioning methods have different areas of high accuracy. In the TDOA/FDOA positioning method, there is a positioning blind area that runs through the satellites' sub-satellite point, while in the AOA positioning method, the satellite's sub-satellite point is the region with the highest positioning accuracy. Aiming at the problem of positioning blind area in TDOA/FDOA positioning, this paper proposes a Satellite Fusion Positioning Algorithm Based on GDOP. By calculating the theoretical error of AOA positioning and TDOA/FDOA positioning, the average values of its random error is estimated as the weight of the fusion positioning. Then use the weight values to fuse the positioning results of the two methods. This algorithm can combine the positioning advantages of each of the two positioning algorithms to effectively improve the problem of positioning blind area in TDOA/FDOA positioning. Moreover, when the variance of the original positioning data is close, the algorithm can reduce the randomness of the positioning results and improve the positioning accuracy</p>
15:00-15:15	<p>C020: Surface damage detection method for blade of wind turbine based on image segmentation</p> <p>Presenter: <i>Bin Hu</i>, China Special Equipment Inspection and Research Institute, China</p> <p>Abstract: Wind energy, as a renewable energy source, has attracted great attention of many countries. It is converted into electricity by the important machine, wind turbine (WT). With the fast growing of WT capacity in the world, the costs of monitoring and maintaining increase year by year. One necessary part of these costs is for blades health situation monitoring, which directly affects effectiveness</p>

	<p>and safety of WT. Thus, the damage detection of the blades is of great significance. The blades suffer from sunshine, acid rain, sand attack, and others, which may cause kinds of damages, such as skin abscission, surface crack, and sand hole. Aiming at surface damage detection of the blades, the paper proposed a method based on variational image segmentation model. At beginning, an idea that objects in an image are left along with detection of the background part is present, and it is changed into an optimization problem by using the level set method and 1-D Heaviside function. Then the corresponding gradient descent minimization algorithm is derived. In the experimental part, a large number of blade images with surface damages are tested by applying the proposed method, and damages are all detected successfully. Moreover, the segmentation results of the noise images show that our method is robust to noise. This paper can provide effective technical support for surface damage detection of WT blades in-service.</p>
<p>15:15-15:30</p>	<p>C028: An image stitching method for blades of wind turbine based on background removal preprocessing Presenter: <i>Weibin Li</i>, Computation Aerodynamics Institute, China Aerodynamics Research and Development Center, China</p> <p>Abstract: The damage detection of the wind turbine (WT) blade is an important aspect of its health situation monitoring. In order to catch small damages, it is necessary to stitch the multi segment images of the blade to obtain a high resolution image. In image stitching, a blurring of the image is carried out to reduce the influence of noise. However, the preprocessing may decrease the amount of feature points and cannot avoid the interaction of feature points in the background and the target parts. To overcome these problems, a preprocessing method based on background removal is proposed. The idea of the method is to carry out image segmentation to get the background part, then the intensities of pixels in background part are replaced by a same value, such as average intensity. Employing the proposed preprocessing method, the image stitching is implemented on several groups of WT blade images. Feature points extraction result are compared between the proposed and the blurring preprocessing, which shows that the proposed method is more robust to the parameters in image stitching process. Moreover, the capability about image stitching and multi-image stitching of the proposed method is well verified by the experiment results.</p>
<p>15:35-15:50 (Video)</p>	<p>C031: LDA Based on Real-time Classification of CCTV Systems Using Codeblocks Information Presenter: <i>Abdou Khadre DIOP</i>, ICT Department at the Alioune DIOP University, Senegal</p> <p>Abstract: Today, CCTV systems play a preponderant role in public security. While we are witnessing many tools for processing these video sequences, the potential to identify abnormal events in such sequences in real time is a difficult problem in computer vision. Using the Latent Dirichlet Allocation (LDA) has brought significant results. In this article, we propose an optimization of the LDA method by relying on information codeblocks to provide a better classification of abnormal events in real-time. The implementation is tested on the normalized PETS datasets. The results obtained make it possible to identify the 'Running' event considered to be abnormal with an accuracy ranging from 86.55%, informed by the assessment of the proposed method with the ROC curves.</p>

15:50-16:05	<p>C047: Para-sagittal Midclavicular Plane Localization in 3DCT Using Multi-Agent Dueling Network Presenter: <i>Yi Li</i>, Southeast University, China</p> <p>Abstract: Locating the para-sagittal on the left portal vein in the abdominal enhanced 3DCT data is a critical step in clinical diagnosis and multi-modality fusion. The process of manually annotating landmarks on the anatomical structure is timeconsuming, laborious, and requires a wealth of professional knowledge. In recent years, reinforcement learning (RL) has developed rapidly, making it possible to deal with complex medical data. This paper is based on model-free RL to train a joint multi-agent detection system. The sharing part of the network provides implicit communication for collaborative work between agents, and independent output helps each agent achieve the purpose of locating specific critical points, respectively. Results show that this method can identify three anatomical landmarks simultaneously on the para-sagittal on the left portal vein correctly, introducing a novel formulation for locating the standard plane of volumes and can deal with complex situations such as intraoperative image fusion. Also, the multi-model convergence time is 30% shorter than that of the single-agent model.</p>
16:05-16:20	<p>C068: Research and Design of Moving Target Detection and Tracking System Based on Web Server Presenter: <i>Jianhui Gao</i>, Fuzhou University, China</p> <p>Abstract: We present an algorithm to improve the detection and tracking of moving target. Combined with the ORB feature detection operator, the center of the target is estimated, and a kind of anti-shadow interference and good matching target detection algorithm is designed. Combined the adaptive filter, a motion object tracking algorithm that resists background color interference and resists short-term occlusion is designed. This paper implements target tracking on embedded ARM-Linux system, completes the design of image acquisition module, image preprocessing design, transplantation of moving target detection and tracking algorithm, and design of video transmission module based on RTP protocol. Finally, web client is designed to view the system's tracking effect. The experimental results show that the system algorithm has a certain ability of anti-illumination and background color interference, and it has adaptability to the short-term occlusion of the target and improves the algorithm detection accuracy, increasing processing time accordingly, decreasing tracking error, with good real-time and accuracy.</p>
16:20-16:35	<p>C089: A Model-Driven Stack-Based Fully Convolutional Network for Pancreas Segmentation Presenter: <i>Hao Li</i>, Shanghai Jiao Tong University, China</p> <p>Abstract: The irregular geometry and high inter-slice variability in computerized tomography (CT) scans of the human pancreas make an accurate segmentation of this crucial organ a challenging task for existing data-driven deep learning methods. To address this problem, we present a novel model-driven stackbased fully convolutional network with a sliding window fusion algorithm for pancreas segmentation, termed MDS-Net. The MDS-Net's cost function includes a data approximation term and a prior knowledge regularization term combined with a</p>

	<p>stack scheme for capturing and fusing the two-dimensional (2D) and local three-dimensional (3D) context information. Specifically, 3D CT scans are divided into multiple stacks to capture the local spatial context feature. To highlight the importance of single slices, the inter-slice relationships in the stack data are also incorporated in the MDS-Net framework. For implementing this proposed model-driven method, we create a stack-based U-Net architecture and successfully derive its back-propagation procedure for end-to-end training. Furthermore, a sliding window fusion algorithm is utilized to improve the consistency of adjacent CT slices and intra-stack. Finally, extensive quantitative assessments on the NIH Pancreas-CT dataset demonstrated higher pancreatic segmentation accuracy and reliability of MDS-Net compared to other state-of-the-art methods.</p>
<p>16:35-16:50</p>	<p>C090: Detection and Classification of Pneumonia from Lung Ultrasound Images Presenter: <i>Chng Chin Boon</i>, National University Of Singapore, Singapore</p> <p>Abstract: The lungs are the primary organs of the respiratory system in humans. Meanwhile, lungs are also vulnerable and are easily damaged by inflammation or impact lesions during the course of our daily lives. Due to the epidemic of COVID-19 pneumonia, the confirmed and suspected cases often grow rapidly beyond the capabilities of medical institutions, rapid and accurate diagnosis for patients have become the first priority. Hence, ultrasound images have started to be adopted in lung diagnosis as they are more convenient, flexible, cheaper, and without ionizing radiation as compared with CT and CXR. This paper aims to use VGG, ResNet and EfficientNet networks to accurately classify Lung Ultrasound images of pneumonia according to different clinical stages based on self-made LUS datasets. The hyperparameters of the three networks were tuned and their performances were carefully compared. Our results indicate that the EfficientNet model outperformed the others, providing the best classification accuracies for 3 and 4 clinical stages of pneumonia are 94.62% and 91.18%, respectively. The best classification accuracy of 8 imagological features of pneumonia is 82.75%. This result is a proof of the promising potential of the LUS device to be used in pneumonia diagnosis and prove the viability of deep learning for LUS classification of pneumonia.</p>

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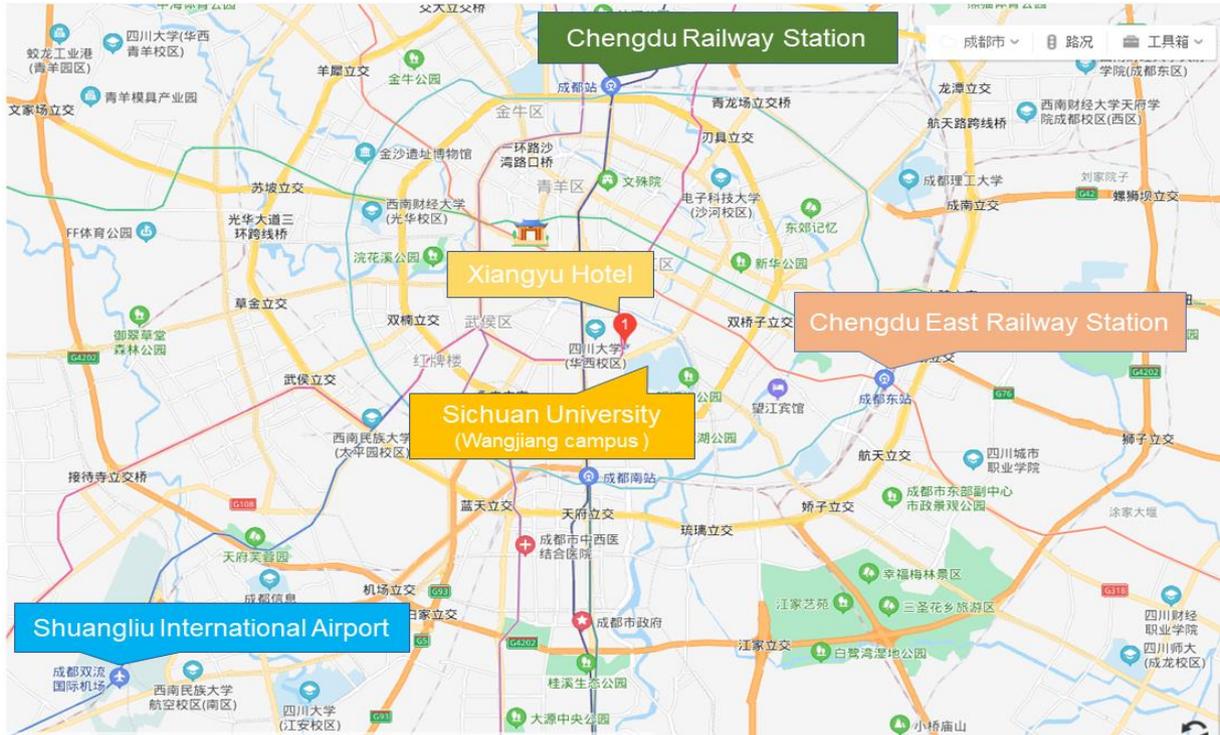
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1、双流机场——祥宇宾馆

Chengdu Shuangliu International Airport —Xiangyu Hotel

A、地铁（Metro）

【10 号线】双流机场 1 航站楼站 → 太平园站【换乘 3 号线】→磨子桥站→步行约 200 米到祥宇宾馆（¥5 元）

【Line 10】Terminal 1 of Shuangliu International Airport station → Taipingyuan station 【Transfer Line 3】→Moziqiao Station→walk 200 meters to Xiangyu Hotel (¥5 Yuan)

Time schedule for Line 10 (10 号线首末班时间):

Terminal 1 (1 航站楼) →Taipingyuan Station (太平园) : 06:05~23:05

Taipingyuan Station (太平园) →Terminal 1 (1 航站楼) : 06:00~23:00

B、出租车（Taxi）

约 36 分钟，17.4 公里 (¥50 元)

About 36 minutes and 17.4 kilometers.(About ¥50 Yuan)

2、成都东站——祥宇宾馆

Chengdu East Railway Station——Xiangyu Hotel

A、地铁 (Metro)

【2 号线】成都东客站→春熙路站【换乘 3 号线】→磨子桥站→步行约 200 米到祥宇宾馆 (¥4 元)

【Line 2】Chengdu East Railway Station→Chunxi Road Station 【Transfer Line 3】→Moziqiao Station→walk 200 meters to Xiangyu Hotel (¥4 Yuan)

Time schedule for Line 2 (2 号线首末班时间):

Chengdu East Railway Station (成都东客站)→Chunxi Road Station (春熙路站) : 06:10~23:00

Chunxi Road Station (春熙路站)→Chengdu East Railway Station (成都东客站) : 06:10~23:00

B、出租车 (Taxi)

约 26 分钟, 11.2 公里 (¥27 元)

About 26 minutes and 11.2 kilometers.(About ¥27 Yuan)

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