

# **2022 13th International Symposium on Chinese Spoken Language Processing (ISCSLP 2022)**

**Singapore  
11-14 December 2022**



**IEEE Catalog Number: CFP22583-POD  
ISBN: 979-8-3503-9797-0**

**Copyright © 2022 by the Institute of Electrical and Electronics Engineers, Inc.  
All Rights Reserved**

*Copyright and Reprint Permissions:* Abstracting is permitted with credit to the source. Libraries are permitted to photocopy beyond the limit of U.S. copyright law for private use of patrons those articles in this volume that carry a code at the bottom of the first page, provided the per-copy fee indicated in the code is paid through Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923.

For other copying, reprint or republication permission, write to IEEE Copyrights Manager, IEEE Service Center, 445 Hoes Lane, Piscataway, NJ 08854. All rights reserved.

***\*\*\* This is a print representation of what appears in the IEEE Digital Library. Some format issues inherent in the e-media version may also appear in this print version.***

IEEE Catalog Number:	CFP22583-POD
ISBN (Print-On-Demand):	979-8-3503-9797-0
ISBN (Online):	979-8-3503-9796-3

**Additional Copies of This Publication Are Available From:**

Curran Associates, Inc  
57 Morehouse Lane  
Red Hook, NY 12571 USA  
Phone: (845) 758-0400  
Fax: (845) 758-2633  
E-mail: [curran@proceedings.com](mailto:curran@proceedings.com)  
Web: [www.proceedings.com](http://www.proceedings.com)

CURRAN ASSOCIATES INC.  
**proceedings**  
.com

## Table of Content

<b>About the Conference</b> .....	<b>XIII</b>
<b>Message from the Conference Chairs</b> .....	<b>XIV</b>
<b>Message from the Program Chairs</b> .....	<b>XV</b>
<b>Conference Committees</b> .....	<b>XVII</b>
<b>Keynote Speeches</b> .....	<b>XXII</b>
<b>Tutorials</b> .....	<b>XXVI</b>
<b>Author Index</b> .....	<b>XXXIII</b>
<b>Papers</b>	
<b>Oral 1: Speech Recognition I</b>	
<b>OS1.1</b> An Ensemble Teacher-Student Learning Approach with Poisson Sub-sampling to Differential Privacy Preserving Speech Recognition <i>Chao-Han Huck Yang, Jun Qi, Sabato Marco Siniscalchi and Chin-Hui Lee</i> .....	<b>1</b>
<b>OS1.2</b> Adaptive Attention Network with Domain Adversarial Training for Multi-Accent Speech Recognition <i>Yanbing Yang, Hao Shi, Yuqin Lin, Meng Ge, Longbiao Wang, Qingzhi Hou and Jianwu Dang</i> .....	<b>6</b>
<b>OS1.3</b> Multilingual Zero Resource Speech Recognition Base on Self-Supervise Pre-Trained Acoustic Models <i>Haoyu Wang, Wei-Qiang Zhang, Hongbin Suo and Yulong Wan</i> .....	<b>11</b>
<b>OS1.4</b> Towards Language-universal Mandarin-English Speech Recognition with Unsupervised Label Synchronous Adaptation <i>Song Li, Haoneng Luo, Wenxuan Hu, Yuan Liu, Shiliang Zhang, Lin Li and Qingyang Hong</i> .....	<b>16</b>
<b>OS1.5</b> Sequence Distribution Matching for Unsupervised Domain Adaptation in ASR <i>Qingxuan Li, Han Zhu, Liuping Luo, Gaofeng Cheng, Pengyuan Zhang, Jiasong Sun and Yonghong Yan</i> .....	<b>21</b>
<b>OS1.6</b> Improving Rare Words Recognition through Homophone Extension and Unified Writing for Low-resource Cantonese Speech Recognition <i>HoLam Chung, Junan Li, Pengfei Liu, Wai Kim Leung, Xixin Wu and Helen Meng</i> .....	<b>26</b>
<b>Oral 2: Speech Production and Perception I</b>	
<b>OS2.1</b> Perception and production of Mandarin vowels by teenagers--blind and sighted <i>Moyu Chen, Jing Qi and Xiyu Wu</i> .....	<b>31</b>
<b>OS2.2</b> The Production of Contrastive Focus by Children Learning Mandarin Chinese <i>Jing Lu and Ping Tang</i> .....	<b>36</b>

<b>OS2.3</b> Production Characteristics of Vowels in Standard Chinese by Preschool Bilingual Teachers <i>Linjiao Pan and Yuan Jia</i> .....	41
<b>OS2.4</b> Effects of Aspiration on Tone Production and Perception in Standard Chinese <i>Chong Cao and Aijun Li</i> .....	46
<b>OS2.5</b> The Disyllabic Tone Production and Tone Context Effect in Mandarin-speaking Children with Cochlear Implants <i>Jingwen Cheng, Yingming Gao, Yuchen Yan, Xiaoli Feng, Binghuai Lin and Jinsong Zhang</i> .....	51
<b>OS2.6</b> A preliminary ultrasonic investigation of tenseness in Northern Yi <i>Shuwen Chen</i> .....	56
<b>Oral 3: Speech Synthesis</b>	
<b>OS3.1</b> Style-Label-Free: Cross-Speaker Style Transfer by Quantized VAE and Speaker-wise Normalization in Speech Synthesis <i>Chunyu Qiang, Peng Yang, Hao Che, Xiaorui Wang and Zhongyuan Wang</i> .....	61
<b>OS3.2</b> Multi-speaker Multi-style Text-to-speech Synthesis with Single-speaker Single-style Training Data Scenarios <i>Qicong Xie, Tao Li, Xinsheng Wang, Zhichao Wang, Lei Xie, Guoqiao Yu and Guanglu Wan</i> .....	66
<b>OS3.3</b> Robust MelGAN: A robust universal neural vocoder for high-fidelity TTS <i>Kun Song, Jian Cong, Xinsheng Wang, Yongmao Zhang, Lei Xie, Ning Jiang and Haiying Wu</i> .....	71
<b>OS3.4</b> AccentSpeech: Learning Accent from Crowd-sourced Data for Target Speaker TTS with Accents <i>Yongmao Zhang, Zhichao Wang, Peiji Yang, Hongshen Sun, Zhisheng Wang and Lei Xie</i> .....	76
<b>OS3.5</b> CorrectSpeech: A Fully Automated System for Speech Correction and Accent Reduction <i>Daxin Tan, Liqun Deng, Nianzu Zheng, Yu Ting Yeung, Xin Jiang, Xiao Chen and Tan Lee</i> .....	81
<b>OS3.6</b> HILvoice: Human-in-the-Loop Style Selection for Elder-Facing Speech Synthesis <i>Xueyuan Chen, Qiaochu Huang, Xixin Wu, Zhiyong Wu and Helen Meng</i> .....	86
<b>Oral 4: Voice Conversion &amp; Spoofing Speech Detection</b>	
<b>OS4.1</b> End-to-End Voice Conversion with Information Perturbation <i>Qicong Xie, Shan Yang, Yi Lei, Lei Xie and Dan Su</i> .....	91
<b>OS4.2</b> Mix-Guided VC: Any-to-many Voice Conversion by Combining ASR and TTS Bottleneck Features <i>Zeqing Zhao, Sifan Ma, Yan Jia, Jingyu Hou, Lin Yang and Junjie Wang</i> .....	96

<b>OS4.3</b> A New Spoken Language Teaching Tech: Combining Multi-attention and AdaIN for One-shot Cross Language Voice Conversion <i>Dengfeng Ke, Wenhan Yao, Ruixin Hu, Qi Luo, Liangjie Huang, Qi Luo and Wentao Shu</i>	101
<b>OS4.4</b> The Impact of Room Acoustics on Replay Speech Signal <i>Madhu R. Kamble and Hemant A. Patil</i>	105
<b>OS4.5</b> Effect of Speaker-Microphone Proximity on Pop Noise: Continuous Wavelet Transform-Based Approach <i>Priyanka Gupta and Hemant A. Patil</i>	110
<b>OS4.6</b> Synthetic Voice Detection and Audio Splicing Detection using SE-Res2Net-Conformer Architecture <i>Lei Wang, Benedict Yeoh and Jun Wah Ng</i>	115
<b>OS4.7</b> Audio Splicing Localization: Can We Accurately Locate the Splicing Tampering? <i>Zhiping Zeng and Zhizheng Wu</i>	120
<b>Oral 5: Speech Enhancement and Separation</b>	
<b>OS5.1</b> Masking-based Neural Beamformer for Multichannel Speech Enhancement <i>Shuai Nie, Shan Liang, Zhanlei Yang, Longshuai Xiao, Wenju Liu and Jianhua Tao</i>	125
<b>OS5.2</b> Deep Multi-task Cascaded Acoustic Echo Cancellation and Noise Suppression <i>Junjie Li, Meng Ge, Longbiao Wang and Jianwu Dang</i>	130
<b>OS5.3</b> Boosting the Performance of SpEx+ by Attention and Contextual Mechanism <i>Chenyi Li, Zhiyong Wu, Wei Rao, Yannan Wang and Helen Meng</i>	135
<b>OS5.4</b> Assessing the Effect of Temporal Misalignment between the Probe and Processed Speech Signals on Objective Speech Quality Evaluation <i>Shangdi Liao and Fei Chen</i>	140
<b>OS5.5</b> Speech-enhanced and Noise-aware Networks for Robust Speech Recognition <i>Hung-Shin Lee, Pin-Yuan Chen, Yao-Fei Cheng, Yu Tsao and Hsin-Min Wang</i>	145
<b>OS5.6</b> Separate-to-Recognize: Joint Multi-target Speech Separation and Speech Recognition for Speaker-attributed ASR <i>Yuxiao Lin, Zhihao Du, Shiliang Zhang, Fan Yu, Zhou Zhao and Fei Wu</i>	150
<b>OS5.7</b> Speech Enhancement Based on CycleGAN with Noise-informed Training <i>Wen-Yuan Ting, Syu-Siang Wang, Hsin-Li Chang, Borching Su and Yu Tsao</i>	155
<b>Oral 6: Speech Recognition II</b>	
<b>OS6.1</b> Incorporating VAD into ASR System by Multi-task Learning <i>Meng Li, Yan Xia and Feng Lin</i>	160
<b>OS6.2</b> Improving ASR in Reverberant Environments <i>Yen-Lun Liao, Chi-Han Lin, Ren-Yuan Lyu and Jyh-Shing Roger Jang</i>	165

<b>OS6.3</b> 3M: Multi-loss, Multi-path and Multi-level Neural Networks for speech recognition <i>Zhao You, Shulin Feng, Dan Su and Dong Yu</i> .....	170
<b>OS6.4</b> Multi-Level Modeling Units for End-to-End Mandarin Speech Recognition <i>Yuting Yang, Binbin Du and Yuke Li</i> .....	175
<b>OS6.5</b> Exploiting Single-Channel Speech for Multi-Channel End-to-End Speech Recognition: A Comparative Study <i>Keyu An, Ji Xiao and Zhijian Ou</i> .....	180
<b>OS6.6</b> Ensemble and Re-ranking based on Language Models to Improve ASR <i>Shu-Fen Tsai, Shih-Chan Kuo, Ren-Yuan Lyu and Jyh-Shing Roger Jang</i> .....	185
<b>Oral 7: Speech Production and Perception II</b>	
<b>OS7.1</b> Acoustic and Perceptual Study of Tones in Jin Chinese (Togtoh variety) <i>Yue Wang and Wen Liu</i> .....	190
<b>OS7.2</b> Acoustic-perceptual correlates of whispered Mandarin consonants <i>Min Xu, Jing Shao, Hongwei Ding and Lan Wang</i> .....	195
<b>OS7.3</b> Bilingual Advantage? Perception of the Japanese Consonant Length Contrast by Monolingual vs Bilingual Speakers of Mongolian <i>Kimiko Tsukada, Yurong and Badmaavanchin Munguntsetseg</i> .....	200
<b>OS7.4</b> Multichannel Emotional Perception in Chinese Female: Faces, Voices and Bodies <i>Ruiqi Ge and Xiyu Wu</i> .....	205
<b>OS7.5</b> Coda Nasal Perception in Wenzhou Wu and Rugao Mandarin by Native Speakers of Standard Mandarin <i>Yanyang Chen, Xinya Zhang, Ying Chen and Jiazheng Wang</i> .....	210
<b>OS7.6</b> Objective Hand Complexity Comparison between Two Mandarin Chinese Cued Speech Systems <i>Li Liu, Gang Feng, Xiaoxi Ren and Xianping Ma</i> .....	215
<b>Oral 8: Speech Synthesis &amp; Speaker Embedding</b>	
<b>OS8.1</b> Rhythm-controllable Attention with High Robustness for Long Sentence Speech Synthesis <i>Dengfeng Ke, Yayue Deng, Yukang Jia, Jinlong Xue, Qi Luo, Ya Li, Jianqing Sun, Jiaen Liang and Binghuai Lin</i> .....	220
<b>OS8.2</b> AdaptiveFormer : A Few-shot Speaker Adaptive Speech Synthesis Model based on FastSpeech2 <i>Dengfeng Ke, Ruixin Hu, Qi Luo, Liangjie Huang, WenHan Yao, Wentao Shu, Jinsong Zhang and Yanlu Xie</i> .....	225
<b>OS8.3</b> ECAPA-TDNN for Multi-speaker Text-to-speech Synthesis <i>Jinlong Xue, Yayue Deng, Yichen Han, Ya Li, Jianqing Sun and Jiaen Liang</i> .....	230
<b>OS8.4</b> Low-Resource Speech Synthesis with Speaker-Aware Embedding <i>Li-Jen Yang, I-Ping Yeh and Jen-Tzung Chien</i> .....	235

<b>OS8.5</b> A Phone-Level Speaker Embedding Extraction Framework with Multi-Gate Mixture-of-Experts Based Multi-Task Learning <i>Zhijunyi Yang, Mengjie Du, Rongfeng Su, Xiaokang Liu, Nan Yan and Lan Wang</i> .....	240
---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-----

<b>OS8.6</b> Shuffle is What You Need <i>Wan Lin, Lantian Li and Dong Wang</i> .....	245
-----------------------------------------------------------------------------------------	-----

**Oral 9: Multimodality**

<b>OS9.1</b> Deep Learning Based Audio-Visual Multi-Speaker DOA Estimation Using Permutation-Free Loss Function <i>Qing Wang, Hang Chen, Ya Jiang, Zhe Wang, Yuyang Wang, Jun Du and Chin-Hui Lee</i> .....	250
----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-----

<b>OS9.2</b> Multi-Task Joint Learning for Embedding Aware Audio-Visual Speech Enhancement <i>Chenxi Wang, Hang Chen, Jun Du, Baocai Yin and Jia Pan</i> .....	255
-------------------------------------------------------------------------------------------------------------------------------------------------------------------	-----

<b>OS9.3</b> Multimodal automatic speech fluency evaluation method for Putonghua Proficiency Test propositional speaking section <i>Jiajun Liu, Huazhen Meng, Yunfei Shen, Linna Zheng and Aishan Wumaier</i> .....	260
------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-----

<b>OS9.4</b> Cantonese neural speech synthesis from found newscasting video data and its speaker adaptation <i>Raymond Chung</i> .....	265
-------------------------------------------------------------------------------------------------------------------------------------------	-----

<b>OS9.5</b> A Preliminary Study on Taiwanese OCR for Assisting Textual Database Construction from Historical Documents <i>Yuan-Fu Liao, Yu-Hsuan Huang, Matus Pleva, Daniel Hládek and Ming-Hsiang Su</i> .....	270
---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-----

<b>OS9.6</b> Reconstruction of speech spectrogram based on non-invasive EEG signal <i>Di Zhou, Masashi Unoki, Gaoyan Zhang and Jianwu Dang</i> .....	275
---------------------------------------------------------------------------------------------------------------------------------------------------------	-----

**Oral 10: Speech Prosody**

<b>OS10.1</b> J-TranPSP: A Joint Transition-based Model for Prosodic Structure Prediction, Word Segmentation and PoS Tagging <i>Binbin Shen, Jian Luan, Shengyan Zhang, Quanbo Shen and Yujun Wang</i> .....	280
-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-----

<b>OS10.2</b> A Mandarin Prosodic Boundary Prediction Model Based on Multi-Source Semi-Supervision <i>Peiyang Shi, Zengqiang Shang and Pengyuan Zhang</i> .....	285
--------------------------------------------------------------------------------------------------------------------------------------------------------------------	-----

<b>OS10.3</b> English lexical stresses in non-native speech under adverse conditions <i>Mosi He, Ting Zhang, Bin Li and Kin Cheung</i> .....	290
-------------------------------------------------------------------------------------------------------------------------------------------------	-----

<b>OS10.4</b> Stress Gravity of Neutral Tone Words in Different Information Structures <i>Jingwen Huang and Aijun Li</i> .....	295
-----------------------------------------------------------------------------------------------------------------------------------	-----

<b>OS10.5</b> Prosodic Encoding of Mandarin Chinese Intonation by Uygur Speakers in Declarative and Interrogative Sentences <i>Tong Li, Hui Feng and Yuan Jia</i> .....	300
----------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-----

<b>OS10.6</b> In-group Advantage for Chinese and English Emotional Prosody in Quiet and Noise Conditions <i>Yuhan Yan, Shanpeng Li and Ying Chen</i> .....	305
---------------------------------------------------------------------------------------------------------------------------------------------------------------	-----

### **Oral 11: Lightweight Model & Knowledge Distillation**

<b>OS11.1</b> Multi-Resolution Stacked 1D-CNN for Small-Footprint keyword Spotting with Two-Stage Detection <i>Jian Tang and Shaofei Xue</i> .....	310
-------------------------------------------------------------------------------------------------------------------------------------------------------	-----

<b>OS11.2</b> Lightweight End-to-End Deep Learning Model for Music Source Separation <i>Yao-Ting Wang, Yi-Xing Lin, Kai-Wen Liang, Tzu-Chiang Tai and Jia-Ching Wang</i> .....	315
-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-----

<b>OS11.3</b> AdaVITS: Tiny VITS for Low Computing Resource Speaker Adaptation <i>Kun Song, Heyang Xue, Xinsheng Wang, Jian Cong, Yongmao Zhang, Lei Xie, Bing Yang, Xiong Zhang and Dan Su</i> .....	319
----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-----

<b>OS11.4</b> Label-free Knowledge Distillation with Contrastive Loss for Light-weight Speaker Recognition <i>Zhiyuan Peng, Xuanji He, Ke Ding, Tan Lee and Guanglu Wan</i> .....	324
--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-----

<b>OS11.5</b> Improving Speech Separation with Knowledge Distilled from Self-supervised Pre-trained Models <i>Bowen Qu, Chenda Li, Jinfeng Bai and Yanmin Qian</i> .....	329
-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-----

<b>OS11.6</b> Text-Informed Knowledge Distillation for Robust Speech Enhancement and Recognition <i>Wei Wang, Wangyou Zhang, Shaoxiong Lin and Yanmin Qian</i> .....	334
-------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-----

### **Oral 12: Speech Technology for Health**

<b>OS12.1</b> Prediction of Depression Severity Based on Transformer Encoder and CNN Model <i>Jiahao Lu, Bin Liu, Zheng Lian, Cong Cai, Jianhua Tao and Ziping Zhao</i> .....	339
----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-----

<b>OS12.2</b> Depressive Tendency Recognition by Fusing Speech and Text Features: A Comparative Analysis <i>Yimin He, Xiaoyong Lu, Jingyi Yuan, Tao Pan and Yafan Wang</i> .....	344
-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-----

<b>OS12.3</b> Medical Difficult Airway Detection using Speech Technology <i>Zhikai Zhou, Shuang Cao, Zhengyang Chen, Bei Liu, Ming Xia, Hong Jiang and Yanmin Qian</i> .....	349
---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-----

<b>OS12.4</b> CUEMPATY: A Counseling Speech Dataset for Psychotherapy Research <i>Dehua Tao, Harold Chui, Sarah Luk and Tan Lee</i> .....	354
----------------------------------------------------------------------------------------------------------------------------------------------	-----

<b>OS12.5</b> Aphasia Detection for Cantonese-Speaking and Mandarin-Speaking Patients Using Pre-Trained Language Models <i>Ying Qin, Tan Lee, Anthony Pak Hin Kong and Feng Lin</i> .....	359
----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-----

<b>OS12.6</b> Respiratory and laryngeal influences on voice in post-stroke dysarthria: a pilot study <i>Tinghao Zhao, Xiaoxia Du, Juan Liu, Rongfeng Su, Nan Yan and Lan Wang</i> .....	364
--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-----

**Oral 13: Listening Comprehension of Machines and Humans**

<b>OS13.1</b> End-to-end speech topic classification based on pre-trained model Wavlm <i>Tengfei Cao, Liang He and Fangjing Niu</i> .....	369
<b>OS13.2</b> BERT-based Chinese Medicine Named Entity Recognition Model Applied to Medication Reminder Dialogue System <i>Tsung-Hsien Yang, Matus Pleva, Daniel Hládek and Ming-Hsiang Su</i> .....	374
<b>OS13.3</b> Dialogue scenario classification based on social factors <i>Yuning Liu, Di Zhou, Masashi Unoki, Jianwu Dang and Aijun Li</i> .....	379
<b>OS13.4</b> BERT-LID: Leveraging BERT to Improve Spoken Language Identification <i>Yuting Nie, Junhong Zhao, Wei-Qiang Zhang and Jinfeng Bai</i> .....	384
<b>OS13.5</b> An Exploratory Study for Quantifying the Contextual Information for Successful Chinese L2 Speech Comprehension <i>Rian Bao, Linkai Peng, Yuchen Yan and Jinsong Zhang</i> .....	389
<b>OS13.6</b> The Contribution of Phonological and Fluency Factors to Chinese L2 Comprehensibility Ratings: A Case Study of Urdu-speaking Learners <i>Rian Bao, Linkai Peng, Yingming Gao and Jinsong Zhang</i> .....	394

**Oral 14: Acoustic Phonetics & Prosody**

<b>OS14.1</b> An Acoustic Study on Fricative Vowel [iz] in Zhongwei Chinese <i>Xinyi Zhang and Wen Liu</i> .....	399
<b>OS14.2</b> Acoustic Features of Consonants of Standard Chinese and English by Uyghur Native Speakers <i>Yuan Jia and Xintong Zuo</i> .....	404
<b>OS14.3</b> A Study on Mandarin Chinese ""Bu"" Tone Sandhi Followed by English Words <i>Kaige Gao and Xiyu Wu</i> .....	409
<b>OS14.4</b> An Entropy-based Study on the Acquisition of Mandarin Initial Consonants by Korean Learners <i>Xiaoli Feng, Yingming Gao, Jinsong Zhang and Yanchun Cao</i> .....	414
<b>OS14.5</b> Impacts of aging on suprasegmental and segmental encoding of vocally-expressed confidence in Wuxi dialect <i>Yujie Ji, Qiqi Sun, Zhikang Peng and Xiaoming Jiang</i> .....	419
<b>OS14.6</b> Acceptance of tonal and segmental variability correlates to inventory size in Mandarin Chinese <i>Julie Siying Chen and Stephen Politzer-Ahles</i> .....	424

**Special Session 1: Data Augmentation in Speech Technologies**

<b>SS1.1</b> Dynamic Thresholding on FixMatch with Weak and Strong Data Augmentations for Sound Event Detection <i>Tanmay Khandelwal and Rohan Kumar Das</i> .....	428
--------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-----

<b>SS1.2</b> Data Augmentation for Infant Cry Classification <i>Aastha Kachhi, Shreya Chaturvedi, Hemant A. Patil and Dipesh Kumar Singh</i> .....	433
<b>SS1.3</b> Low Pass Filtering and Bandwidth Extension for Robust Anti-spoofing Countermeasure Against Codec Variabilities <i>Yikang Wang, Xingming Wang, Hiromitsu Nishizaki and Ming Li</i> .....	438
<b>SS1.4</b> Improving Speech Recognition with Augmented Synthesized Data and Conditional Model Training <i>Shaofei Xue, Jian Tang and Yazhu Liu</i> .....	443
<b>SS1.5</b> Speaking style compensation on synthetic audio for robust keyword spotting <i>Houjun Huang and Yanmin Qian</i> .....	448
<b>SS1.6</b> A Study on Joint Modeling and Data Augmentation of Multi-Modalities for Audio- Visual Scene Classification <i>Qing Wang, Jun Du, Siyuan Zheng, Yunqing Li, Yajian Wang, Yuzhong Wu, Hu Hu, Chao- Han Huck Yang, Sabato Marco Siniscalchi, Yannan Wang and Chin-Hui Lee</i> .....	453
<b>Special Session 2: Deep Noise Reduction</b>	
<b>SS2.1</b> On the Use of Absolute Threshold of Hearing-based Loss for Full-band Speech Enhancement <i>Rohith Mars and Rohan Kumar Das</i> .....	458
<b>SS2.2</b> RAT: RNN-Attention Transformer for Speech Enhancement <i>Tailong Zhang, Shulin He, Hao Li and Xueliang Zhang</i> .....	463
<b>SS2.3</b> A Speech-Noise-Equilibrium Loss Function for Deep Learning-Based Speech Enhancement <i>Weitong Zhao, Fushi Xie, Kang Ouyang and Nengheng Zheng</i> .....	468
<b>SS2.4</b> Speakerfilter-Pro: an improved target speaker extractor combines the time domain and frequency domain <i>Shulin He, Hao Li and Xueliang Zhang</i> .....	473
<b>SS2.5</b> Two-Branch Network with Selective Kernel Convolution for Time-Domain Speech Enhancement <i>Hui Li, Zhihua Huang and Chuangjian Guo</i> .....	478
<b>SS2.6</b> Optimizing Shoulder to Shoulder: A Coordinated Sub-Band Fusion Model for Full- Band Speech Enhancement <i>Guochen Yu, Andong Li, Wenzhe Liu, Chengshi Zheng, Yutian Wang and Hui Wang</i> .....	483
<b>Challenge 1: Conversational Short-Phrase Speaker Diarization Challenge (CSSD)</b>	
<b>GC1.1</b> The Conversational Short-phrase Speaker Diarization (CSSD) Task: Dataset, Evaluation Metric and Baselines <i>Gaofeng Cheng, Yifan Chen, Runyan Yang, Qingxuan Li, Zehui Yang, Lingxuan Ye, Pengyuan Zhang, Qingqing Zhang, Lei Xie, Yanmin Qian, Kong Aik Lee and Yonghong Yan</i> .....	488

**GC1.2** Spectral Clustering Based EEND-vector Clustering: A Robust System Fine-tuned on Simulated Conversations  
*Kai Li* ..... 493

**GC1.3** The X-Lance Speaker Diarization System for the Conversational Short-phrase Speaker Diarization Challenge 2022  
*Tao Liu, Xu Xiang, Zhengyang Chen, Bing Han, Kai Yu and Yanmin Qian* ..... 498

**GC1.4** TSUP Speaker Diarization System for Conversational Short-phrase Speaker Diarization Challenge  
*Bowen Pang, Huan Zhao, Gaosheng Zhang, Xiaoyue Yang, Yang Sun, Li Zhang, Qing Wang and Lei Xie* ..... 502

**Challenge 2: Intelligent Cockpit Speech Recognition Challenge (ICSRC)**

**GC2.1** The ISCSLP 2022 Intelligent Cockpit Speech Recognition Challenge (ICSRC): Dataset, Tracks, Baseline and Results  
*Ao Zhang, Fan Yu, Kaixun Huang, Lei Xie, Longbiao Wang, Eng Siong Chng, Hui Bu, Binbin Zhang, Wei Chen and Xin Xu* ..... 507

**GC2.2** The FawAI ASR System for the ISCSLP 2022 Intelligent Cockpit Speech Recognition Challenge  
*Yujia Sun, Bing Ge, Bo Chen, Zhen Fu, Jinxin He, Hongwei Gao and Xue Wang* ..... 512

**GC2.3** LeVoice ASR Systems for the ISCSLP 2022 Intelligent Cockpit Speech Recognition Challenge  
*Yan Jia, Mi Hong, Jingyu Hou, Kailong Ren, Sifan Ma, Jin Wang, Yinglin Ji, Fangzhen Peng, Lin Yang and Junjie Wang* ..... 517

**GC2.4** Efficient Conformer-Based CTC Model for Intelligent Cockpit Speech Recognition  
*Hanzhi Guo, Yunshu Chen, Xukang Xie, Gaopeng Xu and Wei Guo* ..... 522

**Challenge 3: Chinese-English Code-Switching Automatic Speech Recognition (CSASR)**

**GC3.1** Summary on the ISCSLP 2022 Chinese-English Code-switching ASR Challenge  
*Shuhao Deng, Chengfei Li, Jinfeng Bai, Qingqing Zhang, Wei-Qiang Zhang, Runyan Yang, Gaofeng Cheng, Pengyuan Zhang and Yonghong Yan* ..... 527

**GC3.2** The NPU-ASLP System for The ISCSLP 2022 Magichub Code-Switching ASR Challenge  
*Yuhao Liang, Peikun Chen, Fan Yu, Xinfu Zhu, Tianyi Xu, Yingying Gao and Lei Xie* ..... 532

**GC3.3** Hybrid CTC Language Identification Structure for Mandarin-English Code-Switching ASR  
*Hengxin Yin, Guangyu Hu, Fei Wang and Pengfei Ren* ..... 537