Helin Wang

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Research Interest

My research interest majorly lies in **audio and speech signal processing**, and **machine learning**, including detection and classification of acoustic scenes and events, source separation and speech enhancement.

Education

Peking University, Beijing, China — September 2019 – Present

Master student in School of Electronic and Computer Engineering (ECE), expected July 2022
Supervisor: Yuexian Zou

Tsinghua University, Beijing, China — September 2015 – July 2019

B.S. in Department of Automation (DA)

Experiences

National University of Singapore, Summer Research Internship — May 2021 – Present

Topic: Research on target source separation
Supervisor: Haizhou Li

Tencent AI Lab, Speech Processing Group — May 2020 – Present

Topic: Research on speech enhancement and recognition
Supervisor: Bo Wu and Chao Weng

Ubtech Robotics Inc., Speech Group — July 2019 – September 2019

Topic: Research on audio event classification
Supervisor: Dongyan Huang

University of California Berkeley, Summer Research Internship — July 2018 – September 2018

Topic: Simulation of autonomous driving in California PATH
Supervisor: Masayoshi Tomizuka

Projects

1. **Research on Deep Analysis Method of Acoustic Scenes for Smart Home Robot** — Major Member

   The project is a Shenzhen Science and Technology Fundamental Research Program starting from 2019, which studies the acoustic scenes and events in real home environments, including robust acoustic feature extraction, acoustic scene classification methods, abnormal sound event detection and warning. We have established an audio dataset with a duration of more than 200 hours for home scenes, and achieved the recognition accuracy of 86% for 8 types of sound events.

2. **Research on Multi-modal Health Monitoring System based on Infant Voices** — Leader

   The project is a Shenzhen Science and Technology Fundamental Research Program starting from 2020, which studies the physiological characteristics of infant and conducts abnormal event detection based on audio and video signals. Currently, we have got the detection accuracy of over 96% for the babycry sound.

Selected Publications

1. **Helin Wang**, Yuexian Zou, Wenwu Wang. SpecAugment++: A Hidden Space Data Augmentation Method for Acoustic Scene Classification, Interspeech 2021.

2. **Helin Wang**, Bo Wu, Lianwu Chen, Meng Yu, Jianwei Yu, Yong Xu, Shi-Xiong Zhang, Chao Weng, Dan Su, Dong Yu. TeCANet: Temporal-Contextual Attention Network for Environment-aware Speech Dereverberation, Interspeech 2021.
3. Dongchao Yang, **Helin Wang**, Yuexian Zou. Unsupervised Multi-Target Domain Adaptation for Acoustic Scene Classification, Interspeech 2021.
4. **Helin Wang**, Yuexian Zou, Wenwu Wang. A Global-local Attention Framework for Weakly Labelled Audio Tagging, ICASSP, 2021.
5. Haoran Zhang, Yuexian Zou, **Helin Wang**. Contrastive Self-supervised Learning for Text-independent Speaker Verification, ICASSP, 2021.
6. Zhiqi Huang, Fenglin Liu, Xian Wu, Shen Ge, **Helin Wang**, Wei Fan, Yuexian Zou. Audio-Oriented Multimodal Machine Comprehension via Dynamic Inter- and Intra-modality Attention, AAAI, 2021.
7. **Helin Wang**, Yuexian Zou, Dading Chong, Wenwu Wang. Environmental Sound Classification with Parallel Temporal-spectral Attention, Interspeech, 2020.
8. **Helin Wang**, Yuexian Zou, Dading Chong, Wenwu Wang. Modeling Label Dependencies for Audio Tagging with Graph Convolutional Network, IEEE Signal Processing Letters (SPL), 2020.
9. **Helin Wang**, Yuexian Zou, Dading Chong. Acoustic Scene Classification With Spectrogram Processing Strategies, DCASE Workshop, 2020.
10. **Helin Wang**, Bang Yang, Yuexian Zou, Dading Chong. Automated Audio Captioning with Temporal Attention, DCASE Challenge, 2020.
11. **Helin Wang**, Dading Chong, Dongyan Huang, Yuexian Zou. What Affects the Performance of Convolutional Neural Networks for Audio Event Classification, ACIIW, 2019.

SERVICES

- TASLP, Neurocomputing, Interspeech, ICASSP — Reviewer (or PC Member)

HONORS AND AWARDS

- IEEE AASP Challenge on Detection and Classification of Acoustic Scenes and Events — 2021
  Team ranking: **1**/25 in Task5 and **4**/37 in Task6.
- IEEE AASP Challenge on Detection and Classification of Acoustic Scenes and Events — 2020
  Team ranking: **6**/179 in Task1 and **3**/34 in Task6.
- **3rd** Prize of Peking University — 2019 – 2020

SKILLS

- Programming Languages: Python, C++, Matlab
- Platform: Linux
- Others: Pytorch, Tensorflow