Heming Wang

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RESEARCH INTERESTS

Speech enhancement, bandwidth extension, self-supervised learning.

EDUCATION

The Ohio State University, Columbus, OH, USA — August 2018 - Present
Advisor: Prof. DeLiang Wang
Ph.D. student, Computer Science and Engineering

University of Waterloo, Waterloo, ON, Canada — August 2016 - May 2018
Advisor: Prof. Richard Mann & Prof. Edward Vrscay
Master of Mathematics, Applied Mathematics

University of Waterloo, Waterloo, ON, Canada — August 2014 - May 2016
Bachelor of Science, Physics & Computer Science Minor

Harbin Institute of Technology, Harbin, HL, China — August 2012 - May 2014
Electric Science and Technology

PUBLICATIONS

H. Wang, Y. Qian, X. Wang, Y. Wang, C. Wang, S. Liu, T. Yoshioka, J. Li and D. L. Wang, "Improving Noise Robustness of Contrastive Speech Representation Learning with Speech Reconstruction," in *IEEE International Conference on Acoustics, Speech and Signal Processing* (**ICASSP**), under review, 2021.

Y. Wang, J. Li, **H. Wang**, Y. Qian, C. Wang and Y. Wu, "Wav2vec-Switch: Contrastive Learning from Original-noisy Speech Pairs for Robust Speech Recognition," in *IEEE International Conference on Acoustics, Speech and Signal Processing* (**ICASSP**), under review, 2021.

H. Wang, X. Zhang and D. L. Wang, "Attention-based Fusion for Bone-conducted and Air-conducted Speech Enhancement in the Complex Domain," in *IEEE International Conference on Acoustics, Speech and Signal Processing* (**ICASSP**), under review, 2021.

H. Wang and D. L. Wang, "Cross-domain Speech Enhancement With A Neural Cascade Architecture," in *IEEE International Conference on Acoustics, Speech and Signal Processing* (**ICASSP**), under review, 2021.

H. Wang and D. L. Wang, "Neural Cascade Architecture with Triple-domain Loss for Speech Enhancement," in *IEEE/ACM Transactions on Audio, Speech, and Language Processing* (**IEEE/ACM TASLP**), under review, 2021.

H. Wang and D. L. Wang, "Towards Robust Speech Super-resolution," in *IEEE/ACM Transactions on Audio, Speech, and Language Processing* (**IEEE/ACM TASLP**), vol. 29, pp. 2058-2066, 2021.

H. Wang and D. L. Wang. "Time-Frequency Loss for CNN Based Speech Super-Resolution," in *IEEE International Conference on Acoustics, Speech and Signal Processing* (**ICASSP**), pp. 861-865, 2020.

H. Wang, R. Mann, and E. R. Vrscay, "A Diffusion-Based Two-Dimensional Empirical Mode Decomposition Algorithm for Image Analysis," in *International Conference Image Analysis and Recognition* (**ICIAR**), pp. 293-305, 2018.

RESEARCH EXPERIENCES

Research Intern — Microsoft Inc.
May-August 2021 — Seattle, Washington, United States

- Use self-supervised learning to improve robust automatic speech recognition

Research Intern — Elevoc Inc.
May-August 2020 — Shenzhen, Guangdong, China

- Efficient network for bandwidth extension on mobile devices
- Bandwidth extension for bone-conducted speech

Graduate Research Assistant — The Ohio State University
August 2018 - Present — Columbus, Ohio, USA

- Speech super-resolution
- Speech enhancement

Graduate Research Assistant — University of Waterloo
August 2016 - May 2018 — Waterloo, Ontario, Canada

- Real-time signal processing for ultrasound
- Empirical mode decomposition for signal analysis
- Bayesian methods for blind source separation

Research Intern — AISpeech
May-August 2016 — Suzhou, Jiangsu, China

- Chinese singing voice synthesis
- Part-of-speech tagging

Undergraduate Research Assistant — University of Waterloo
May-August 2015 — Waterloo, Ontario Canada

- Formant synthesis for English vowels
- Real-time spectrum analysis using MyDAQ

COMPUTER SKILLS

Python, C++, Bash, MATLAB, Pytorch, Tensorflow, Keras.

AWARDS

University Fellowship — 2018
The Ohio State University

Entrance Scholarship — 2014
Department of Physics & Astronomy, University of Waterloo