

## Heming Wang

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### RESEARCH INTERESTS

Speech enhancement, self-supervised learning and generative AI.

### 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 Vrscaj  
*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** and D. L. Wang. "Cross-Domain Diffusion Based Speech Enhancement for Very Noisy Speech." in *IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*, 2023.

**H. Wang**, Yao. Q, H. Yang, N. Kanda, P. Wang, T. Yoshioka, X. Wang, Y. Wang, S. Liu, Z. Chen and others. "DATA2VEC-SG: Improving Self-Supervised Learning Representations for Speech Generation Tasks." in *IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*, 2023.

**H. Wang**, X. Zhang, and D. L. Wang. "Fusing Bone-conduction and Air-conduction Sensors for Complex-Domain Speech Enhancement." *IEEE/ACM Transactions on Audio, Speech, and Language Processing (IEEE/ACM TASLP)*, Vol. 30, pp. 3134-3143. 2022.

Y. Zhang, **H. Wang**, and D. L. Wang, "Densely-connected Convolutional Recurrent Network for Fundamental Frequency Estimation in Noisy Speech," in the 23th Annual Conference of the International Speech Communication Association (**INTERSPEECH**), pp. 401-405, 2022.

**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)*, pp. 6062-6066, 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)*, pp. 7097-7101, 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)*, pp. 7757-7761, 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)*, pp. 7862-7866, 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)*, vol. 30, pp. 734-743, 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** Tencent Inc.  
May-August 2023 Seattle, Washington, United States

- Nearfield sound resynthesis with vocodec / codec

**Research Intern** Microsoft Inc.  
May-August 2022 Seattle, Washington, United States

- Use self-supervised learning to improve generative performance of speech representations

**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**  
August 2016 - May 2018

University of Waterloo  
Waterloo, Ontario, Canada

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

**Research Intern**  
May-August 2016

AISpeech  
Suzhou, Jiangsu, China

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

**Undergraduate Research Assistant**  
May-August 2015

University of Waterloo  
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**  
The Ohio State University

2018

**Entrance Scholarship**  
Department of Physics & Astronomy, University of Waterloo

2014