

Ke Tan

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Research Interests

Speech enhancement, speech separation, speech dereverberation, microphone array processing, audio-visual speech enhancement and separation, acoustic echo cancellation, keyword spotting, robust speech recognition, and deep learning.

Education

- **The Ohio State University (OSU)** Columbus, OH, United States
Ph.D. student in Computer Science and Engineering Aug. 2015 - present
- **The Ohio State University (OSU)** Columbus, OH, United States
M.S. in Computer Science and Engineering Aug. 2015 - Dec. 2019
- **University of Science and Technology of China (USTC)** Hefei, Anhui, China
B.E. in Electronic Information Engineering Aug. 2011 - Jun. 2015

Professional Experience

- **The Ohio State University** Columbus, OH, United States
Graduate Research Associate Jan. 2017 - present
 - Single- and Multi-Channel Speech Enhancement and Separation
 - Supervisor: Prof. DeLiang Wang
- **Facebook Reality Labs** Redmond, WA, United States
Research Intern May 2020 - Aug. 2020
 - Binaural Speaker Separation with Interaural Cue Preservation
 - Mentor: Dr. Buye Xu
- **Tencent AI Lab** Bellevue, WA, United States
Research Intern May 2019 - Aug. 2019
 - Audio-Visual Speech Separation and Dereverberation
 - Mentor: Dr. Yong Xu and Dr. Dong Yu
- **Baidu USA - KITT.AI group** Bellevue, WA, United States
Research Intern May 2018 - Aug. 2018
 - Small-Footprint Keyword Spotting with Quantization-Aware Training
 - Mentor: Dr. Guoguo Chen

Journal/Letter Publications

- [J8] **Ke Tan** and DeLiang Wang. “Towards Model Compression for Deep Learning Based Speech Enhancement”, in submission to *IEEE/ACM Transactions on Audio, Speech, and Language Processing (IEEE/ACM TASLP)*.
- [J7] **Ke Tan**, Xueliang Zhang, and DeLiang Wang. “Deep Learning Based Real-Time Speech Enhancement for Dual-Microphone Mobile Phones”, in submission to *IEEE/ACM Transactions on Audio, Speech, and Language Processing (IEEE/ACM TASLP)*.
- [J6] Eric W. Healy, **Ke Tan**, Eric M. Johnson, and DeLiang Wang. “An Effectively Causal Deep Learning Algorithm to Increase Intelligibility in Novel Noises for Hearing-Impaired Listeners”, in *Journal of the Acoustical Society of America (JASA)*, accepted, 2021.

- [J5] **Ke Tan**, Buye Xu, Anurag Kumar, Eliya Nachmani, and Yossi Adi. “SAGRNN: Self-Attentive Gated RNN for Binaural Speaker Separation with Interaural Cue Preservation”, in *IEEE Signal Processing Letters (IEEE SPL)*, vol. 28, pp. 26-30, 2021.
- [J4] **Ke Tan**, Yong Xu, Shi-Xiong Zhang, Meng Yu, and Dong Yu. “Audio-Visual Speech Separation and Dereverberation with a Two-Stage Multimodal Network”, in *IEEE Journal of Selected Topics in Signal Processing (IEEE JSTSP)*, vol. 14, pp. 542-553, 2020.
- [J3] **Ke Tan** and DeLiang Wang. “Learning Complex Spectral Mapping with Gated Convolutional Recurrent Networks for Monaural Speech Enhancement”, in *IEEE/ACM Transactions on Audio, Speech, and Language Processing (IEEE/ACM TASLP)*, vol. 28, pp. 380-390, 2020.
- [J2] Peidong Wang, **Ke Tan**, and DeLiang Wang. “Bridging the Gap Between Monaural Speech Enhancement and Recognition with Distortion-Independent Acoustic Modeling”, in *IEEE/ACM Transactions on Audio, Speech, and Language Processing (IEEE/ACM TASLP)*, vol. 28, pp. 39-48, 2020.
- [J1] **Ke Tan**, Jitong Chen, and DeLiang Wang. “Gated Residual Networks with Dilated Convolutions for Monaural Speech Enhancement”, in *IEEE/ACM Transactions on Audio, Speech, and Language Processing (IEEE/ACM TASLP)*, vol. 27, pp. 189-198, 2019.

Conference Publications

- [C12] **Ke Tan**, Xueliang Zhang, and DeLiang Wang. “Real-Time Speech Enhancement for Mobile Communication Based on Dual-Channel Complex Spectral Mapping”, in *IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*, accepted, 2021.
- [C11] **Ke Tan** and DeLiang Wang. “Compressing Deep Neural Networks for Efficient Speech Enhancement”, in *IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*, accepted, 2021.
- [C10] **Ke Tan** and DeLiang Wang. “Improving Robustness of Deep Learning Based Monaural Speech Enhancement Against Processing Artifacts”, in *IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*, pp. 6914-6918, 2020.
- [C9] Hao Zhang, **Ke Tan** and DeLiang Wang. “Deep Learning for Joint Acoustic Echo and Noise Cancellation with Nonlinear Distortions”, in *the 20th Annual Conference of the International Speech Communication Association (INTERSPEECH)*, pp. 4255-4259, 2019.
- [C8] Peidong Wang, **Ke Tan** and DeLiang Wang. “Bridging the Gap Between Monaural Speech Enhancement and Recognition with Distortion-Independent Acoustic Modeling”, in *the 20th Annual Conference of the International Speech Communication Association (INTERSPEECH)*, pp. 471-475, 2019.
- [C7] **Ke Tan** and DeLiang Wang. “Complex Spectral Mapping with a Convolutional Recurrent Network for Monaural Speech Enhancement”, in *IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*, pp. 6865-6869, 2019.
- [C6] **Ke Tan**, Xueliang Zhang, and DeLiang Wang. “Real-Time Speech Enhancement Using an Efficient Convolutional Recurrent Network for Dual-Microphone Mobile Phones in Close-Talk Scenarios”, in *IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*, pp. 5751-5755, 2019.
- [C5] Zhong-Qiu Wang, **Ke Tan**, and DeLiang Wang. “Deep Learning Based Phase Reconstruction for Speaker Separation: A Trigonometric Perspective”, in *IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*, pp. 71-75, 2019.
- [C4] **Ke Tan** and DeLiang Wang. “A Convolutional Recurrent Neural Network for Real-Time Speech Enhancement”, in *the 19th Annual Conference of the International Speech Communication Association (INTERSPEECH)*, pp. 3229-3233, 2018.
- [C3] **Ke Tan** and DeLiang Wang. “A Two-Stage Approach to Noisy Cochannel Speech Separation with Gated Residual Networks”, in *the 19th Annual Conference of the International Speech Communication Association (INTERSPEECH)*, pp. 3484-3488, 2018.
- [C2] **Ke Tan**, Jitong Chen, and DeLiang Wang. “Gated Residual Networks with Dilated Convolutions for Supervised Speech Separation”, in *IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*, pp. 21-25, 2018.

- [C1] Shilin Zhu, **Ke Tan**, Xinyu Zhang, Zhiqiang Liu, and Bin Liu. “MICROST: A Mixed Approach for Heart Rate Monitoring During Intensive Physical Exercise Using Wrist-Type PPG Signals”, in *37th Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC)*, pp. 2347-2350. IEEE, 2015.

Presentations

- *Gated Residual Networks with Dilated Convolutions for Supervised Speech Separation*, IEEE ICASSP, Calgary, Alberta, Canada, Apr. 2018. [talk]
- *Deep Learning Based Phase Reconstruction for Speaker Separation: A Trigonometric Perspective*, IEEE ICASSP, Brighton, United Kingdom, May 2019. [talk]
- *Real-Time Speech Enhancement Using an Efficient Convolutional Recurrent Network for Dual-Microphone Mobile Phones in Close-Talk Scenarios*, IEEE ICASSP, Brighton, United Kingdom, May 2019. [talk]
- *Complex Spectral Mapping with a Convolutional Recurrent Network for Monaural Speech Enhancement*, IEEE ICASSP, Brighton, United Kingdom, May 2019. [poster]
- *Improving Robustness of Deep Learning Based Monaural Speech Enhancement Against Processing Artifacts*, IEEE ICASSP (virtually due to COVID-19 pandemic), Barcelona, Spain, May 2020. [talk]

Professional Skills

Programming:

- Proficient in: Python, C++, C, MATLAB, Java
- Familiar with: HTML5, CSS, \LaTeX

Deep Learning Related Toolkits:

PyTorch, TensorFlow, Keras, CNTK, Kaldi, and other scientific computing libraries.

Academic Services

- Reviewer, IEEE/ACM Transactions on Audio, Speech, and Language Processing
- Reviewer, IEEE Signal Processing Letters
- Reviewer, IEEE Journal of Selected Topics in Signal Processing
- Reviewer, IEEE Communications Letters
- Reviewer, Speech Communication

Teaching Experience

- **The Ohio State University** Columbus, OH
Graduate Teaching Associate *Aug. 2015 - Dec. 2016*
 - CSE 1110 - Introduction to Computing Technology
 - CSE 3421 - Introduction to Computer Architecture
 - CSE 6421 - Computer Architecture

Honors and Awards

USTC Scholarship for Outstanding Students (Gold Award)	2014
CAS Scholarship (CAS - Chinese Academy of Sciences)	2013
USTC Scholarship for Outstanding Students (Silver Award)	2012