

# Ke Tan

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## Research Interests

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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

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- **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

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- **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

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- [J9] **Ke Tan**, Zhong-Qiu Wang, and DeLiang Wang. “Spatial Filtering Without Beamforming”, in submission to *IEEE/ACM Transactions on Audio, Speech, and Language Processing (IEEE/ACM TASLP)*, 2021.
- [J8] Eric W. Healy, **Ke Tan**, Eric M. Johnson, and DeLiang Wang. “An Effectively Causal Deep Learning Algorithm to Increase Intelligibility in Unique Noises for Hearing-Impaired Listeners”, in *Journal of the Acoustical Society of America (JASA)*, vol. 149, pp. 3943-3953, 2021.
- [J7] **Ke Tan**, Xueliang Zhang, and DeLiang Wang. “Deep Learning Based Real-Time Speech Enhancement for Dual-Microphone Mobile Phones”, in *IEEE/ACM Transactions on Audio, Speech, and Language Processing (IEEE/ACM TASLP)*, vol. 29, pp. 1853-1863, 2021.

- [J6] **Ke Tan** and DeLiang Wang. “Towards Model Compression for Deep Learning Based Speech Enhancement”, in *IEEE/ACM Transactions on Audio, Speech, and Language Processing (IEEE/ACM TASLP)*, vol. 29, pp. 1785-1794, 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

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- [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)*, pp. 6134-6138, 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)*, pp. 8358-8362, 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

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- *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

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### Programming:

- Proficient in: Python, C++, C, MATLAB, Java
- Familiar with: HTML5, CSS, L<sup>A</sup>T<sub>E</sub>X

### Deep Learning Related Toolkits:

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

## Academic Services

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- 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, The Journal of the Acoustical Society of America
- Reviewer, Speech Communication

## Teaching Experience

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- **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

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