Ke Tan

Email : tanke1116@gmail.com
Homepage : https://jupiterethan.github.io/

Research Interests

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

Education

- **The Ohio State University** — Columbus, OH, USA
  Ph.D. in Computer Science and Engineering — *Aug. 2015 - Aug. 2021*
  M.S. in Computer Science and Engineering — *Aug. 2015 - Dec. 2019*
  - Advisor: Prof. DeLiang Wang
  - Ph.D. Dissertation: Convolutional and recurrent neural networks for real-time speech separation in the complex domain

- **University of Science and Technology of China** — Hefei, Anhui, China
  B.E. in Electronic Information Engineering — *Aug. 2011 - Jun. 2015*

Professional Experience

- **Facebook Reality Labs Research** — Redmond, WA, USA
  Research Scientist — *Aug. 2021 - present*

- **The Ohio State University** — Columbus, OH, USA
  Graduate Research Associate — *Jan. 2017 - Aug. 2021*
  - Single- and Multi-Channel Speech Enhancement and Separation
  - Supervisor: Prof. DeLiang Wang

- **Facebook Reality Labs** — Redmond, WA, USA
  Research Intern — *May 2020 - Aug. 2020*
  - Binaural Speaker Separation with Interaural Cue Preservation
  - Mentor: Dr. Buye Xu

- **Tencent AI Lab** — Bellevue, WA, USA
  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, USA
  Research Intern — *May 2018 - Aug. 2018*
  - Small-Footprint Keyword Spotting with Quantization-Aware Training
  - Mentor: Dr. Guoguo Chen

Journal/Letter Publications

[J9] **Ke Tan**, Zhong-Qiu Wang, and DeLiang Wang. "Neural spectrospatial filtering", in *IEEE/ACM Transactions on Audio, Speech, and Language Processing (**IEEE/ACM TASLP**)*, vol. 30, pp. 605-621, 2022.

[J8] Eric W. Healy, **Ke Tan**, Eric M. Johnson, and DeLiang Wang. "An effectively causal deep learning algorithm to increase intelligibility in untrained 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

[C13] Hassan Taherian, **Ke Tan**, and DeLiang Wang. "Location-based training for multi-channel talker-independent speaker separation", in submission to *IEEE International Conference on Acoustics, Speech and Signal Processing (**ICASSP**)*, 2022.

[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

- *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 (virtual due to COVID-19 pandemic), Barcelona, Spain, May 2020. [talk]
- *Real-Time Speech Enhancement for Mobile Communication Based on Dual-Channel Complex Spectral Mapping*, IEEE ICASSP (virtual due to COVID-19 pandemic), Toronto, Ontario, Canada, Jun. 2021. [talk & poster]
- *Compressing Deep Neural Networks for Efficient Speech Enhancement*, IEEE ICASSP (virtual due to COVID-19 pandemic), Toronto, Ontario, Canada, Jun. 2021. [talk & poster]

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

Teaching Experience

- **The Ohio State University** — Columbus, OH, USA
  Graduate Teaching Associate — *Aug. 2015 - Dec. 2016*
  - CSE 1110 - Introduction to Computing Technology

- CSE 3421 - Introduction to Computer Architecture
- CSE 6421 - Computer Architecture