Tingle Li

Research Assistant

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Education

Tiangong University — *Tianjin, China*

B.Eng. in Computer Science and Technology, GPA: 3.74/4.0 (top 5%) — *Sep. 2016-Jun. 2020*

- Honors Program of Artificial Intelligence (an elite program for top 10% students)
- Advisor: Prof. Ming Li (Duke University), Prof. Rize Jin (Tiangong University)

Tsinghua University — *Beijing, China*

Post-bachelor at Institute for Interdisciplinary Information Sciences (IIIS) — *Jul. 2020-Present*

- Engage in research about Multimodal Interaction
- Advisor: Prof. Hang Zhao

Research Interests

Source Separation, Speech Enhancement, Music Information Retrieval, Multimodal Learning

Publications

Optimal Mapping Loss: A Faster Loss for End-to-End Speaker Diarization

- Qingjian Lin*, **Tingle Li***, Lin Yang, Junjie Wang, and Ming Li.
- *In Proc. Speaker Odyssey,* Tokyo, Japan, November 2020.

Atss-Net: Target Speaker Separation via Attention-based Neural Network

- **Tingle Li**, Qingjian Lin, Yuanyuan Bao, and Ming Li.
- *In Proc. INTERSPEECH,* Shanghai, China, October 2020.

The DKU Speech Activity Detection and Speaker Identification Systems for Fearless Steps Challenge Phase-02

- Qingjian Lin, **Tingle Li**, and Ming Li.
- *In Proc. INTERSPEECH,* Shanghai, China, October 2020.

Sams-Net: A Sliced Attention-based Neural Network for Music Source Separation

- **Tingle Li**, Jiawei Chen, Haowen Hou, and Ming Li.
- Submitted to *IEEE Signal Processing Letters*.

Selected Honors & Awards

Three years of Dean's List and Merit Scholarship, *2016-2019*
Third Prize of the "Lan-Qiao" Cup National Selection Competition, *May. 2017*
First Prize of the China Students Innovation and Entrepreneurship Competition (7.9% of all), *May. 2019*
Best Undergraduate Dissertation (top 1%), *Jun. 2020*
First rank for SID and third rank for SAD among the world in Fearless Steps Challenge Phase-02, *May. 2019*

Research Experiences

Duke Kunshan University — *Suzhou, China*

Research Intern, Speech and Multimodal Intelligent Information Processing (SMIIP) Lab — *Jul. 2019 - Present*

- Advisor: Prof. Ming Li
- Research on speech separation, including speaker separation and music separation.

Samsung Research Institute China — *Beijing, China*

Research Intern, Language Intelligence Team, Speech Lab — *Jan. 2020 - Mar. 2020*

- Implemented a joint speech enhancement and separation system, which was prepared for Bixby.

Tianjin Key Laboratory of Autonomous Intelligence Technology and Systems *Tianjin, China*

Student Research Assistant *Sep. 2018 - Jun. 2019*

- Advisor: Prof. Reze Jin
- Mastered Deep Learning-based method for speech processing, especially in music information retrieval
- Learned some basic knowledge about speech processing, such as Short-time Fourier transform (STFT), GMM-HMM, Fbank and MFCC, etc.

Research Projects

Target Speaker Separation via Attention-based Neural Network

- Given a referenced utterance of the target speaker, and a mixed utterance containing the target speaker, this system aims at filtering the target speaker's voice from the mixed utterance. Demos are available at here.
- Tried to modify the LSTM layer with the attention mechanism, which is used to combine the target speaker embedding and the mixed spectrogram. Experimental results show that our model yields better performance than the VoiceFilter proposed by Google.

A Sliced Attention-based Neural Network for Music Source Separation

- Given a musical utterance, our goal is to recover the individual stems from the mixed signal (i.e., vocals, drums, bass and other). Demos are available at here.
- Proposed a new attention mechanism called Sliced Attention, where the scope of attention is narrowed down to the intra-chunk features that are most likely to affect each other.
- Our model has achieved the state-of-the-art performance when it comes to the SDR metric, although it contained fewer parameters compared with the baselines.

Singing Voice Separation for Singer Verification

- Given a musical utterance, this task aims to identify who is singing.
- First inputing the musical utterance into the separation system to separate the vocals of it, then using the speaker verification system to identify the singer.
- This technique was used as the third party duplicate checking technique for Guinness Records of the CCTV National Day Celebration Program, and the news can be found at here.