Jingwei Zhao

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Education

Shanghai Jiao Tong University (SJTU) *Sept 2017 – Jul 2021 (Expected)*

B.E. *with Honors* in Automation (Artificial Intelligence Track)

- GPA: 88.94/100; 3.77/4.0 Ranking: 6/107
- Selected Courses: Artificial Intelligence (94/100), Machine Learning (91/100), Signals and Systems (93/100), Digital Signal Processing (90/100), Discrete Mathematics (99/100), Music Theory (100/100)

Research Experience

Algorithm Arrangement via Search and Style Transfer *Jul 2020 – Present*

Research Assistant | Prof. Gus Xia | Music X Lab, New York University Shanghai (NYUSH)

- Proposed an automation framework to arrange accompaniment for lead melodies (with chord labels) by matching the melody query with existing accompaniment targets and manipulating the targets in the latent space
- Devised a rule-based matching strategy to hold rhythmic consistency: first search for a target melody whose rhythm and chord progression best resemble the query's, and then retrieve the paired accompaniment
- Extended a style-transfer VAE to improve consonance: substitute the accompaniment target's chord progression with that of the melody query in the latent space, and reconstruct the manipulated target

Real-Time Music-Driven Dance Generation for Humanoid Robot *Oct 2019 – Jul 2020*

Research Assistant | Prof. Yue Gao | Artificial Intelligence Institute, SJTU

- Extracted 3D dance pose from videos and segmented it into dance units by onsets of background music beats
- Adopted unit selection methodology as means of generating robot-executable dance, where the dance is improvisational, rendered unit by unit through two selection criteria: semantic relevance and transition stability
- Applied Madmom to track beats and synchronize the dance to the music in real-time with PID control

Cross Modality Learning for Sound and Visual Scene *Apr 2019 – Mar 2020*

Research Assistant | Prof. Xu Zhao | Vision Lab, SJTU

- Put forward a novel idea to "watch and listen" for video understanding and proposed a CNN "listener" model using Mel-spectrogram of video soundtracks as input to predict video labels
- Combined the "listener" model with Pseudo-3D (a SOTA traditional visual-based video classifier) by late fusion, and obtained 1.5% accuracy gain on the Kinetics-600 Dataset
- Introduced dot-product attention between feature pairs of aligned image and audio to fully explore the interaction and dependency between sound and visual scene

Sound Frequency Analysis for Tightness Detection *Mar 2020 – Jun 2020*

Research Assistant | Prof. Wenbin Yu | Department of Automation, SJTU

- Proposed to predict the tightness (air pressure) of slot wedges of the electric generator (which is hard to detect directly) by analysis of the tapping sound, and acquired a waveform dataset with 10 tightness categories
- Extracted MFCC and log-energy of the waveform and fed them to a KNN classifier to predict tightness, gained an accuracy of 99.45% on the test set, and revealed a positive correlation between frequency and tightness

Publication

Liu, C., **Zhao, J. (Co-First)**, Liu, G., Gao, Y., and Gao, X., 2020. D2EA: Depict the Epidemic Picture of COVID-19. Journal of Shanghai Jiao Tong University (Science), *25, pp.165-176*.

Miscellaneous

Honor and Award

- Han-Ying-Ju-Hua Scholarship (Top 10 / 750) *2019-2021*
- Zhiyuan Honors Scholarship (Top 5%) *2017-2021*
- SJTU Undergraduate Excellent Scholarship (Top 10%) *2018-2021*
- Meritorious Winner for MCM/ICM (Team Leader, Top 7%) *Apr 2019*

Skill

- Music: accordion (professional), piano, and bel canto (baritone)
- Programming Language: Python (Pytorch, and Tensorflow 2.0), C++, and MATLAB
- English: TOFEL 108, and GRE 326 (Quant 170)

Extracurricular Activity

- Member of Shanghai Computer Music Association (SCMA) *Feb 2019 – Present*
- Baritone singer at SJTU Student Choir *Dec 2017 – Present*