Jingwei Zhao

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Education

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

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

- GPA: 88.94/100; 3.88/4.0 (WES) Ranking: 6/107
- Core Courses: Artificial Intelligence (94/100), Machine Learning (91/100), Discrete Mathematics (99/100), Signals and Systems (93/100), Digital Signal Processing (90/100), 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

- Proposed an automation framework to arrange accompaniment for lead melodies (with chord labels) by adapting from underlying arrangements in existing corpora via manipulation in the latent space
- Extended a VAE to encode chord and texture attributes of polyphonic arrangements into disentangled latent representations, and realized phrase-level arrangement style transfer by representation swapping
- Introduced a chord discriminator to a melody VAE and conducted adversarial training to disentangle chord components from melody representations, and realized reliable melody generation subject to chord control

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

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

- Adopted unit selection methodology as a means of generating robot-executable dance, where the dance is rendered unit by unit through two selection criteria: semantic relevance and transition stability
- Introduced scaled dot-product attention to detect potential conflicts in the joint space when the robot transitions among dance motion units, and to predict the stability of each unit
- Applied online beat tracking with a feedback control loop to synchronize the dance to the music in real-time

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

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 categories
- Combined the "listener" model with Pseudo-3D (a SOTA traditional visual-based video classifier) by weighted average fusion, and obtained 1.5% accuracy gain on the Kinetics-600 Dataset
- Proposed to detect human action events in complex-scene videos by defining motion frequencies and filtering frequency components along the temporal axis, and validated the feasibility with baseline demos

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

Honors

- Han-Ying-Ju-Hua Scholarship (Top 10 / 750) *2018-2020*
- Zhiyuan Honors Scholarship (Top 5%) *2017-2021*
- SJTU Undergraduate Excellent Scholarship (Top 10%) *2017-2019*
- Meritorious Winner for the Interdisciplinary Contest in Modeling (Team Leader, Top 7%) *Apr 2019*

Skills

- Music: accordion (professional), piano, and bel canto (baritone)
- Programming: Python (Pytorch and Tensorflow), C++, and MATLAB

Activities

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