

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: 10/107
- 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 a melody query (with chord progression) by matching the query with existing accompaniment targets and manipulating the targets in the latent space
- Devised a rule-based matching strategy to hold rhythmic consistency: firstly 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* 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

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 AND MANUSCRIPT

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.

Zhao, J., and Zhao, X. Look and Listen: Exploiting Interaction between Sound and Visual Scene. (Manuscript)

Zhao, J., He, Z., and Gao, Y. Humanoid Robot Dance Generation over Real-Time Music Stimulation. (Manuscript)

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)

Service and Extracurricular Activity

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