Yinghao Ma

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EDUCATION BACKGROUND

Peking University   09.2016–07.2020
School of Mathematical Sciences, Department of Mathematics
- Overall GPA: 3.4/4.0
- Research interests：   ***Music Information Retrieval, Audio Signal Processing***
- Programming languages: Good command of Python, familiar with MATLAB and C++
- Music Background: Conductor in the orchestra of Chinese Music Institute, Peking University
                          Amateur Highest Performance Level of Chinese flute, China Conservatory of Music
- Awards and Honors：   Excellence in the preliminary prize for S.-T.Yau College Student Mathematics Contests
                          3rd prize for National College Physics Competition

RESEARCH EXPERIENCES

Automatic Musical Instrument Recognition and Timbre Recognition   02/2019 – 07/2019
Research Assistant, Supervised by Prof. Xiaoou Chen, Peking University
- Set up a series of quartet database from DCMI database shared by China Conservatory of Music.
- Constructed an audio event detection model based on CRNN to detect and recognize instruments.
- Evaluated the percussion, recall rate and F-measure of the model and CNN baseline model, and compare the difference among different quartet databases generate from different music skills or music type in DCMI database.
- Drafted the paper and submitted to the Conference on Sound and Music Technology of China.

Correspondence between Speech Melody and Pitch Contour in Sichuan Folk Song   07/2019 –now
Research Assistant, Supervised by Prof. Zhiyao Duan, University of Rochester
- Made a literature review of linguistics papers on relations between speech melody and notes in tone language song.
- Set up a database on Sichuan folk song with music scores in MusicXML form, lyrics audio in Sichuan dialect in wav form and note-audio alignment character by character.
- Analyzed the correspondence among the tone of each character, the change of fundamental frequency of each character audio and the change of music notes linked to it.
- Evaluated different correspondence rates in different type of folk songs

SELECTED PROJECTS

Music and Mathematics (95%)   06/2019
Supervised by Prof. Jie WANG
- Generated the same Polyphonic melody in different musical temperament with noise through MATLAB.
- Evaluated the MFCCs of the sound files and co-designed a classifier on based on FCNN to distinguish the musical temperament of each sound files.
- Compared the accuracy of the model with baseline algorithm (Fast Fourier transform).
- Discussed topics on music theory, music in 20th century and the algebra structure.

Digital Signal Process(91%)
Supervised by Prof. Yuxin CHENG and Prof. Yong SHANG
- Constructed a simulation voice communication system. Used the square of the cosine filter instead of FIR filter for relatively low-frequency gain and get better result on signal amplitude and SNR.
- Discussed different type of FFT, structures of different digital filter and finite wordlength effects.

Chinese Instrumental Music Classics (100%)   12/2018
Musical aesthetics and appreciation of Chinese music, Supervised by Prof. Minghui BI
- Analyzed Chinese music piece in different genre and aesthetic tags and compared with western music.
- Discussed the function of title in Chinese music and musical aesthetics and compared it with program music.
- Demonstrated the difference on music form and aesthetics between Chinese chapter music and sonata.
- Analyzed different performance techniques on two version of a Chinese sonata.

EXTRACURRICULAR ACTIVITIES AND LEADERSHIP

- Conductor in Chinese Music Institute, Peking University. Organized rehearsals of Chinese philharmonic orchestra and held concert each semester.
- The leader of Academic Department, Chinese Music Institute, Peking University. Holding seminar on music theory, acoustic and music information retrieval.
- One of the core members and seminar organizers of music composition association.
- Teaching Assistant of Western Music Appreciate course and Music and Mathematics course.