

Yinghao Ma

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EDUCATION BACKGROUND

Carnegie Mellon University

09.2020 – 05.2022

MS: music & technology, School of Music. Supervised by prof. Richard Stern

- Overall GPA: 3.9/4.0
- Research interests: **Music Information Retrieval, Speech Signal Processing, Sound Event Detection**
- Programming languages: Good command of Python3 and MATLAB
- Music Background: Recording a Chinese musical version of Beethoven's serenade to commemorate the 250th anniversary of his birth

Peking University

09.2016 – 07.2020

School of Mathematical Sciences, Department of Mathematics

- Overall GPA: 3.4/4.0
- 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 & INTERNSHIP EXPERIENCES

Learnable Frontend for Music, Speech and Audio

09/2021 – Now

Research Assistant, Supervised by Prof. Richard Stern, Carnegie Mellon University

- Design learnable frontends for deep learning models inspired by classic filters, multi-rate sampling & modulation.

Cover Song Detection & Evaluation of Automatic Speech Recognition

05/2021 – 08/2021

Algorithm Engineer, Supervised by Yifei Zhang, Tencent Holdings Limited. (Beijing)

- Reproduced and refined music separation & covering detection. Evaluating different ASR models on business data.

Tempo, Beats and Downbeats Detection in Chinese Pop Songs

06/2020 – 08/2020

Algorithm Engineer, Supervised by Jian Wu, Beijing Deepmusic Technology Co.

- Detection based on BiLSTM and TCN. Much better than Librosa and Madmom.

Chinese Flute Playing Technique Detection and Classification

02/2020 – 05/2020

Research Assistant, Supervised by Prof. Xiaoou Chen, Peking University

- Design a music technique detector based on FCNN, much better than VGG.

Correspondence between Speech Melody and Pitch Contour in Sichuan Folk Song

07/2019 – 09/2019

Research Assistant, Supervised by Prof. Zhiyao Duan, University of Rochester

- Set up a database on Sichuan folk song with music scores in MusicXML form, lyrics audio in Sichuan dialect in way 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.

Automatic Musical Instrument Recognition and Timbre Recognition

02/2019 – 07/2019

Research Assistant, Supervised by Prof. Xiaoou Chen, Peking University

- 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. Paper accepted in CSMT(2019).

SELECTED COURSES

TEACHING ASSISTANT of Machine Learning for Signal Processing

08/2021 – 12/2021

- Gave lectures on ICA; design and grade quizzes and homework on NMF, SVM, EM, HMM etc.; design project topics

Introduction to Deep Learning (A)

05/2021

- MLP, CNN, LSTM and application in speech & CV. BERT, GAN, Hopfield Nets, Boltzmann machine will be learnt.
- Unsupervised detection on anime scene switching based on β VAE, much better than VAE.

Advanced Digital Signal Processing (A, 1st rank of the class)

12/2020

- Signal sampling, interpolation, STFT, classical estimation and maximum entropy of PSD function, LPC, adaptive filtering with LMS/RMS algorithm, microphone array and beam forming. MFCC, Introduction to Wavelet Analysis.

Convex Optimization (on going)

12/2021

Natural Language Processing (A)

05/2021

Introduction to Computer Music (A)

05/2021

Fundamental Chinese Phonetics (92/100)

01/2020

Mathematical Statistics (90/100)

06/2019

EXTRACURRICULAR ACTIVITIES AND LEADERSHIP

- Conductor in Chinese Music Institute, Peking University. Held rehearsals of philharmonic chamber & concert.
- Holding seminar on music theory, acoustic, music signal processing and music information retrieval.
- One of the core members and seminar organizers of music composition association.