Zehao Wang

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Education

UC San Diego	**California, U.S.A.**
PhD student	*2021 - Present*
Computer Music, Department of Music	

Peking University	**Beijing, China**
Undergraduate	*2017 − 2021*
Major in Data Science (Math), School of Mathematical Sciences, advised by Prof. Zhanxing Zhu	

China Conservatory of Music	**Beijing, China**
Private Course	
Music Composition	
Advisor: Prof. Fei Wang	

Experience (Detailed information can be found in my website.)

Academic

New York University Shanghai	**Shanghai, China**
Music X Lab	*May 2020 - Jul 2021*

Host: Prof. Gus G. Xia
- Disentanglement representation learning for controllable chord progression generation based on VAE.

School of Psychological and Cognitive Sciences, Peking University	**Beijing, China**
Bao Lab	*Mar 2020 - Jul 2021*

Advisor: Prof. Yan Bao
- Bayesian model of internal reference in temporal perception.

Queen Mary University of London & Central Conservatory of Music	**Beijing, China**
Innovative Instrument Design - Du Xian Qin International Workshop	*Sep 2019*

Host: Prof. Nick Bryan-Kinns & Prof. Zijin Li
- Improving and augmenting the traditional Duxianqin, designing some new functions for it, mainly about the joystick.
- Chinese website construction and English-Chinese translation.

CCRMA, Stanford University	**Palo Alto, CA, U.S.**
Neural Networks for Music Workshop	*Aug 2019*

Host: Prof. Wendy Ju & David Goedicke
- Using ResNet for real-time audio classification.
- Collecting and recording the Stanford sound dataset.

School of Mathematical Sciences, Peking University	**Beijing, China**
Deep Leaning Lab	*May 2019 - Sep 2020*

Advisor: Prof. Zhanxing Zhu
- Working on algorithms and theoretical analysis for robustness and interpretability of deep neural network.
- Theoretical analysis on frequency domain of gradient-based adversarial examples of neural network.

Wangxuan Institute of Computer Technology, Peking University	**Beijing, China**
Digital Audio Lab	*Apr 2018 - Dec 2019*

Advisor: Prof. Xiaoou Chen
- Improving a two-stage automatic pitch correction framework of singing voice using WSOLA algorithm and PyWorld.
- Releasing a dataset and designing a FCN based algorithm for musical instrument playing technique detection.
- Proposing some melody features for designing a melody co-creation system based on Transformer.

Industry (both technology and music)

ByteDance	**Beijing, China**
Research Intern in AI Lab	*Nov 2020 - Mar 2021*

○ **ByteDance**   **Beijing & Shanghai, China**
Research Intern in AI Lab, Mentor: Dr. Bilei Zhu   *Dec 2019 - Sep 2020*

○ **Microsoft**   **Beijing, China**
Research Intern in Speech Group, Mentor: Dr. Lei He and Xi Wang   *Jun 2019 - Dec 2019*

Teaching and Other Music Experience

○ **Academy of Opera, Peking University**   **Beijing, China**
Adjunct Piano Accompanist   *Apr 2019 - Jul 2021*

- Working for rehearsal and concert, including art songs, chorus and opera.

○ **Teaching**
- Teaching assistant:
  · MUS174A, Audio MIDI Techniques, 2021 Fall, UC San Diego
  · Economics and Computation, 2019 Summer, Peking University
- Lecturer:
  · American Mathematics Competitions (in English), 2020 Summer, Online
  · Mathematical Olympiad, 2017 Summer, Zhengzhou No.1 High School

○ **Other music experience**
- Independent music producer (on Xiami Music & Netease Music)
- Orchestra and choir arranger
- Piano accompanist, chamber music conductor

Publications

(* denotes equal contribution)

Regular Papers (including submissions and preprints)

1. **Zehao Wang***, Bochen Lyu*, Pu Yang*, Zhanxing Zhu. **A frequency domain analysis of gradient-based adversarial examples**, *submitted to ICML 2021*, 2021.
2. **Zehao Wang**, Zhesong Yu, Xiaoou Chen, Bilei Zhu, Yuan Wan, Zejun Ma. **Compose with Me: Co-Creating Melody with Transformer and Selecting by Phrase-Level Melody Features**, *preprint*, 2020.
3. **Zehao Wang***, Jingru Li*, Xiaoou Chen, Zijin Li, Shicheng Zhang, Baoqiang Han, Deshun Yang. **Musical Instrument Playing Technique Detection Based on FCN: Using Chinese Musical Instruments as Examples**, *to submit to a journal, arXiv preprint(previous version): 1910.09021*, 2020.
(Short Version appears at *ECML PKDD 2020 - 13th International Workshop on Machine Learning and Music* as a **Contributed Talk.**)

Workshop Papers

1. **Zehao Wang***, Jingru Li*, Xiaoou Chen, Zijin Li, Shicheng Zhang, Baoqiang Han, Deshun Yang. **Deep Learning vs. Traditional MIR: a Case Study on Musical Instrument Playing Technique Detection**, *ECML PKDD 2020 - 13th International Workshop on Machine Learning and Music*, 2020.

Skills

○ **Programming:** Python>=Matlab>C++=Java=HTML=Julia
○ **Framework:** Pytorch & TensorFlow (Deep Learning); React.js (Front-end); JUCE, Csound, Supercollider, Puredata and Faust (Music Related)
○ **Language:** Chinese(Native), English(Fluent)

Honors and Awards

The **First Prize** of Contemporary Undergraduate Mathematical Contest in Modeling	Sep 2018
The **Silver Medal** of 32nd Chinese Mathematical Olympiad	Dec 2016
The **Second Place** of 32nd National Mathematics League in Henan Division	Sep 2016
The **Third Place** of 13th Chinese Southeast Mathematical Olympiad	Aug 2016
The **First Place** of Pearl River - Kayserburg International Youth Piano Competition	Aug 2015
The **Second Prize** of Musical Ensemble Track in Art Festival of Henan Province	Jul 2015