

# HUAN ZHANG

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## EDUCATION

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### Queen Mary University of London, London, UK

Ph.D student in Artificial Intelligence and Music, Center for Digital Music  
Research Topic: *Computational modelling of expressive piano performance.*

September 2021 - Present

### Carnegie Mellon University, Pittsburgh, PA

Bachelor of Science in Music and Technology, minor in Computer Science, GPA: 3.7/4.0

September 2017 - May 2021

## RESEARCH AND PROJECTS

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**H. Zhang**, E. Karystinaios, S. Dixon, G. Widmer, C. E. Cancino-Chacón. "Symbolic Music Representations for Classification Tasks: A Systematic Evaluation", in proceeding of *24th International Society for Music Information Retrieval Conference (ISMIR 2023)*.

**H. Zhang**, S. Dixon. "Disentangling the Horowitz Factor: Learning Content and Style from Expressive Piano Performance", in proceeding of *International Conference on Acoustics, Speech, and Signal Processing (ICASSP) 2023*.

**H. Zhang**, **J. Tang**, **S. Rafee**, G. Wiggins, G. Fazekas, S. Dixon. "ATEPP: A Dataset of Automatically Transcribed Expressive Piano Performance", in proceeding of *23rd International Society for Music Information Retrieval Conference (ISMIR 2022)*.

**H. Zhang**, Y. Jiang, Y. Jiang, P. Hu. "Learn By Referencing: Towards Deep Metric Learning for Singing Assessment", in proceeding of *22nd International Society for Music Information Retrieval Conference (ISMIR 2021)*

S. Dai, **H. Zhang**, R. Dannenberg. "Automatic Analysis and Influence of Hierarchical Structure on Melody, Rhythm and Harmony in Popular Music", in proceeding of *Joint Conference on AI Music Creativity (CSMC-MuMe 2020)*

## ONGOING RESEARCH

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*Diffusion-based Expressive Piano Performance Generation with Controls by Perceptual Features*: The generation is on symbolic (MIDI) level but training is through an 'expression encoding' of tempo curves, velocity curves and detailed timing. Demo-samples [here](#).

*Towards a Query-based Coach in Expressive Performance Assessment*: Audio + Text to Text (standard audio encoder + LLM), but in the domain of music education, answering questions like "How is the rhythm stability in this students' performance?", or "What is the technical challenge of this piece?"

## PROFESSIONAL EXPERIENCE

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### Research Visit

*Institut für Computational Perception, Vienna, Austria*

Jan 2023 - May 2023

- Collaboratively developed the symbolic music processing package **Partitura**, incremented the features in piano performance codec and expression analysis, with ongoing collaboration in large-scale analysis of performance expressions.
- Work in investigations about representation of symbolic music data, published in ISMIR 2023.

### Music Research and Development Intern

*Tencent Music Entertainment, Shenzhen, China*

Dec 2020 - May 2021

- Working under WeSing Audio and Music Lab (now LYRA Lab), investigated the task of Singing Assessment with triplet model architecture, publication in ISMIR 2021.
- Trained audio auto-tagging model to analyze short video scene on the platform.
- Conducted a survey of music education mobile applications in China and their technology solutions.

### Music Research and Development Intern

*Kuaishou Technology, Beijing, China*

June 2020 - Oct 2020

- Tackled the task of automatic melody harmonization by proposing a seq2seq approach with transformer model.
- Completed the entire life-cycle including analyzing and processing data from Wikifonia, Hooktheory and POP909 symbolic datasets, tuning and training the transformer, to testing and inferencing.
- Proposed a melody harmonization evaluation scheme that's used to evaluate the quality of generated chord.

## HONORS/AWARDS

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ISMIR 2023 Diversity and Inclusion Grant

July 2023

UKRI PhD studentships in Artificial Intelligence and Music (AIM) receiver

Sept 2021

CMU Summer Internship Experience Fund (SIEF) Receiver  
Ranked top 1000 in Putnam Mathematical Competition  
Carnegie Mellon University Dean's List

April 2019  
Dec 2017  
2017-2019

## INVOLVEMENT AND LEADERSHIP

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### Paper reviewing

- Reviewed conference and journal papers of ISMIR 2023, ICASSP 2024, 2023, IEEE/ACM Transactions on Audio Speech and Language Processing, EURASIP Journal on Audio, Speech, and Music Processing

### WiMIR Mentor

Mar-Aug 2022

- Hold one-to-one meeting with undergraduate student signed up to Women in Music Information Retrieval (WiMIR) initiative, providing them with insights in research scene, application and academia life.

### CMU Laptop Orchestra

Jan 2019 - May 2019

#### *Collaborative Project*

- A project lead by professor Roger Dannenberg and implemented by music technology students, it presents a Multi-thread, network-based real time laptop music-generation performance. I am contributing as one of the laptop instrumentalist with saxophone and piano, with jazz-style composition algorithm written in Serpent and synchronizing with the conductor over the network. [Performance Video \(Youtube\)](#)

### Music Involvement

- Classical Piano Performance: In this performance video I played Bach's Well Tempered Clavier in b minor, book 1, and the Jeux D'eau by Maurice Ravel. [Performance Video \(Youtube\)](#) ([Bilibili](#))
- With full musicianship training from solfege, counterpoint to orchestration, I was also able provide music theory tutorials for my colleges and peers.

## SKILLS AND COURSEWORKS

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QMECS7006P - Music Informatics	Spring 2022
QMECS7013P - Deep Learning for Audio and Music	Spring 2022
QMECS707 - Digital Signal Processing	Fall 2021
QMECS741P - Music Perception	Fall 2021
CMU10605 - Machine Learning with Large Datasets	Fall 2021
CMU15780 - Graduate Artificial Intelligence	Spring 2021
CMU10701 - Introduction to Machine Learning	Spring 2020
CMU15210 - Parallel and Sequential Data Structures and Algorithms	Fall 2019
CMU15213 - Introduction to Computer Systems	Fall 2019
CMU15323 - Computer Music Systems and Information Processing	Spring 2019
CMU11411 - Natural Language Processing	Fall 2019