Baotong Tian

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Education

Tsinghua University   **September 2020 – Present**

Bachelor of Engineering in Automation

GPA 3.86/4.0(top 15%)

Core Courses

- **Mathematics**: Calculus A, Linear Algebra, Random Mathematics and Statistics, Numerical Analysis and Algorithms, Discrete Mathematics
- **Computer Science**: Computer Languages and Programming, Data Structures, Principles and Systems of Computer, Signals and System Analysis, Basis of Artificial Intelligence, Pattern Recognition and Deep Learning
- **Music**: Music Phenomena in The Multi-Culture, Vocal Foundation to Improve, Theory and Production of Song Arrangement

Research Experience

Controllable Sheet Music Generation   **June, 2021-Dec, 2022**

Advisor: Xin Jin & Duo Xu & Song-chun Zhu

Beijing Institute for General Artificial Intelligence

- Learned music psychology and emotion perception in music.
- Learned the Generative Theory of Tonal Music and basic structure analysis of music.
- Implementation of music And-or-Graph.
- Implemented genetic algorithm for **music variation** in Python.

Explainable Machine Learning   **Feb, 2023-Present**

Advisor: Jiwen Lu & Jie Zhou

Department of Automation, Tsinghua University

- **Unified** current frameworks of Shapley values estimation.
- Proposed **SimSHAP** as a simple and fast amortized Shapley values estimator. (Paper submitted to **ICLR'24**, currently under review.)

Work Experience

Music Information Retrieval–Chord Recognition   **Jun, 2023-Aug, 2023**

Advisor: Jian Wu

Beijing Deepmusic Technology Co.

- Applied Bi-LSTM for joint learning of bass and chord quality(Automatic Chord Recognition).
- Applied Conditional Random Field as post-filtering methods to improve the performance of chord recognition tasks.

Achievements

- **2021 & 2022 Tsinghua Arts and Culture Merit Scholarship** (Received for students who have specialty in art and have made great contribution for cultural activities within the department)
- **2022 Friends of Tsinghua-Weichai Power Scholarship** (Received for excelling GPA throughout the school year)

Skills & Interests

Programming Skills:

- Proficient: Python, PyTorch, Markdown, LaTeX, Git
- Familiar: MATLAB, C/C++, Linux, TensorFlow, HTML, etc

Languages:

- TOEFL iBT: 104/120 (Reading 26, Listening 29, Speaking 24, Writing 25)
- GRE: 328/340 + 4.0/6.0 (Verbal 158, Quantitative 170, Analytical Writing 4.0)

Music Background & Interests

- Learned Electric Piano from age 5 to 12 and got the Amateur Highest Performance Level at the age of 12.
- Started Learning Guitar at the age of 13.
- Learned basic music production skills such as music arrangement and mixing on my own.
- Selected to join Tsinghua University's Music Dream Programme for the Class of 2021-2022, which is designed to nurture and develop campus musicians.
- Four songs have already been released on QQ music & The NetEase's cloud music, produced by Logic Pro X.
- Link:My musician page on [The NetEase's Cloud Music](#) and [QQ Music](#)