YUSONG WU (吴雨松)

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EDUCATION

Beijing University of Posts and Telecommunications — Beijing, China

BE in Automation — 09/2016 - 06/2020

University of Montréal & Quebec Artificial Intelligence Institute (MILA) — Montréal, Canada

MSc in Computer Science – Artificial Intelligence — 09/2020 - 08/2022 (expected)

Advisor: Prof. Aaron Courville, Prof. Chengzhi Anna Huang

GPA: 4.0/4.0

PUBLICATIONS & MANUSCRIPTS

- **Yusong Wu**, Ethan Manilow, Yi Deng, Rigel Swavely, Kyle Kastner, Tim Cooijmans, Aaron Courville, Cheng-Zhi Anna Huang, Jesse Engel: *MIDI-DDSP: detailed control of musical performance via hierarchical modeling.* **ICLR 2022 Oral**
- **Yusong Wu**, Kun Chen, Ziyue Wang, Xuan Zhang, Fudong Nian, Xi Shao, Shengchen Li: *Audio Captioning Based on Transformer and Pre-Training for 2020 DCASE Audio Captioning Challenge.* Technical Report, DCASE2020 Challenge
- **Yusong Wu**, Shengchen Li, Chenzhu Yu, Heng Lu, Chao Weng, Dong Yu: *Peking Opera Synthesis via Duration Informed Attention Network.* INTERSPEECH 2020
- Liqiang Zhang, Chengzhu Yu, Heng Lu, Chao Weng, **Yusong Wu**, Xiang Xie, Zijin Li, Dong Yu: *DurIAN-SC: Duration Informed Attention Network based Singing Voice Conversion System*. INTERSPEECH 2020
- **Yusong Wu**, Shengchen Li: *Guqin Dataset: A symbolic music dataset of Chinese Guqin collection*. Proceedings of China Conference on Sound and Music Technology (CSMT 2019)
- **Yusong Wu**, Shengchen Li: *Distinguishing Chinese Guqin and Western Baroque pieces based on statistical model analysis of melodies*. International Symposium on Computer Music Multidisciplinary Research (CMMR 2019)

SELECTED RESEARCH EXPERIENCE

Hierarchical Music Generation with Detailed Control — 09/2020 – now

Collaborate with advisors and members of Google Magenta teams

- Propose MIDI-DDSP, a hierarchical music generation model with explicit and interpretable representation for controlling musical performance and synthesis.
- MIDI-DDSP can reconstruct high-fidelity audio, accurately predict performance attributes for a note sequence, independently manipulate the attributes of a given performance, and as a complete system, generate realistic audio from a novel note sequence.

2nd Place in DCASE 2020 Challenge Task 6: Automatic Audio Captioning — 03/2020 - 07/2020

IEEE AASP Challenge on Detection and Classification of Acoustic Scenes and Events

- Proposed a sequence-to-sequence model with a CNN as encoder and a Transformer as decoder, with data augmentation, data regulation, pre-training, and fine-tuning for accurate automatic audio captioning.
- The proposed system ranked 2nd in all participants (1st as an academic team).
- The proposed system won the Reproducible System Award.

Singing Synthesis System — 08/2019 – 05/2020

Research Intern, Tencent AI Lab.

- Adapted from DurIAN system to build a singing synthesis system which generates Mel-spectrogram from musical score input and generates audio using WaveRNN.
- ***Expressive Singing Performance***: Experimented synthesizing Peking Opera singing with expressiveness in singing by inputting musical note, with the dynamics in Peking opera singing learned from the spectrogram.
- ***Learning Singing from Speech***: Experimented generating singing with the voice timbre learned from speech by jointly training singing and fine-tuning speech synthesis using fundamental frequency input.

MUSIC EXPERIENCE

- Over 10 years of percussion experience in orchestra, wind symphony, and marching band. Proficient in Timpani. Started playing percussion at age 6.
- Played with famous Chinese pop singer Jie Zhang in 2016 on the show "Singer".

SELECTED AWARD

- DIRO x Quebec Ministry of Higher Education international students scholarship, CAD $4000 2022
- Outstanding Paper – 1st CtrlGen Workshop at NeurIPS 2021 2021
- Reproducible System Award – DCASE Challenge 2020
- 2nd Place overall (1st as an academic team) on automated audio captioning, IEEE AASP Challenge on Detection and Classification of Acoustic Scenes and Events (DCASE) 2020
- Student Grant of INTERSPEECH – Early student registration + 1-year ISCA membership 2020
- The Québec Bursary Granting Exemption from Differential Tuition Fees 2020
- 2rd Prize of Academic Scholarship (Top 15%) 2019
- Gold Price in Beijing University Orchestra Performance 2018