YUSONG WU

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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 - 06/2022 (expected)

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

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.* **Submitted to ICLR 2022, under review**.
- **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 achieved by a SPIDEr score of 0.214.
- The proposed system won 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 generating Mel-spectrogram from musical score input, and generating 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

- Reproducible System Award – DCASE Challenge 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