

# YUSONG WU

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## EDUCATION

**Beijing University of Posts and Telecommunications**

BE in Automation

Beijing, China

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 with triple 8 scores](#). Accepted by 1<sup>st</sup> [CtrlGen Workshop](#) at NeurIPS 2021
- **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.

[2<sup>nd</sup> 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 2<sup>nd</sup> in all participants achieved by a SPIDeR score of 0.214.
- 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

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- 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

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| • 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 |