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***, Ke Chen*, Tianyu Zhang, Yuchen Hui, Taylor Berg-Kirkpatrick, Shlomo Dubnov: *Large-scale Contrastive Language-Audio Pretraining with Feature Fusion and Keyword-to-Caption Augmentation*. Submitted to ICASSP 2023

- **Yusong Wu**, Kyle Kastner, Tim Cooijmans, Cheng-Zhi Anna Huang, Aaron Courville: *Datasets That Are Not: Evolving Novelty Through Sparsity and Iterated Learning*. Accepted by Workshop on Machine Learning for Creativity and Design at NeurIPS 2022.

- **Yusong Wu**, Josh Gardner, Ethan Manilow, Ian Simon, Curtis Hawthorne, Jesse Engel: *The Chamber Ensemble Generator: Limitless High-Quality MIR Data via Generative Modeling*. https://arxiv.org/abs/2209.14458

- **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 (top 5%)**

- **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.
- Github repo with 230+ stars

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".
- Participant in AI Song Contest 2022, won 3rd place.

COMMUNITY CONTRIBUTION

- Co-organize Music+AI Reading Group: YouTube Channel | Google Group

SELECTED AWARD

3rd place in AI Song Contest 2022	2022
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