

# YUSONG WU (吴雨松)

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## EDUCATION

<b>Beijing University of Posts and Telecommunications</b>	Beijing, China
BE in Automation	09/2016 - 06/2020
<b>University of Montréal &amp; Quebec Artificial Intelligence Institute (MILA)</b>	Montréal, Canada
Advisor: <a href="#">Prof. Aaron Courville</a> , <a href="#">Prof. Chengzhi Anna Huang</a>	
Ph.D. in Computer Science – Artificial Intelligence	09/2022 - now
MSc in Computer Science – Artificial Intelligence   GPA: 4.3/4.3	09/2020 - 09/2022

## SELECTED PUBLICATIONS

- **Yusong Wu**, Tim Cooijmans, Kyle Kastner, Adam Roberts, Ian Simon, Alexander Scarlatos, Chris Donahue, Cassie Tarakajian, Shayegan Omidshafiei, Aaron Courville, Pablo Samuel Castro, Natasha Jaques, Cheng-Zhi Anna Huang: *Adaptive Accompaniment with ReaLchords*. **ICML 2024**
- Ke Chen, **Yusong Wu**, Haohe Liu, Marianna Nezhurina, Taylor Berg-Kirkpatrick, Shlomo Dubnov: *MusicLDM: Enhancing Novelty in Text-to-Music Generation Using Beat-Synchronous Mixup Strategies*. **ICASSP 2024**.
- **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*. **ICASSP 2023**
- **Yusong Wu**, Josh Gardner, Ethan Manilow, Ian Simon, Curtis Hawthorne, Jesse Engel: *The Chamber Ensemble Generator: Limitless High-Quality MIR Data via Generative Modeling*. *arXiv preprint arXiv: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 (2<sup>nd</sup> place)**
- **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**

## SELECTED RESEARCH EXPERIENCE

<b>Interactive Real-time Music Accompaniment Models</b>	07/2022-now
Ph.D. Research Topic	
Student Researcher at Google Magenta team, Deepmind	08/2023-05/2024
<ul style="list-style-type: none"><li>• Focus on building generative models that support real-time music interaction with users.</li><li>• Leverage RL and Multi-agent RL to train generative models that anticipate and adapt to real-time human inputs, and effectively recover from error.</li><li>• <a href="#">ReaLchords</a>: real-time melody-to-chord accompaniment model via RL finetuning.</li><li>• <a href="#">GenJam</a>: real-time interactive system with delay-tolerance model inference and anticipatory model output visualization.</li></ul>	
<b>Open-Vocabulary Audio Event Localization</b>	07/2024-12/2024
Internship project at Adobe	
<ul style="list-style-type: none"><li>• Build models to localize audio events in an audio queried by text prompt.</li></ul>	

## Audio-Language Multimodal Learning

03/2022-05/2023

Collaborate with LAION.ai, and work as project lead

- Collect text-audio data, train multi-model understanding models between language and audio, and train text-to-audio synthesis models.
- As the initial work, build an audio-language contrastive learning model. Collected the biggest audio-text dataset at the time containing 630k pairs. Open sourced [Model GitHub Repo](#) & [Dataset GitHub Repo](#) with 2k+ stars combined.

## Hierarchical Music Generation with Detailed Control

09/2020 – 07/2022

Collaborate with advisors and members of [Google Magenta](#) team

- 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 300+ stars

## [2<sup>nd</sup> Place](#) in DCASE 2020 Challenge Task 6: Automatic Audio Captioning

03/2020 - 07/2020

## Singing Synthesis System

08/2019 – 05/2020

Research Intern, Tencent AI Lab.

## 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 [3<sup>rd</sup> place](#).

## COMMUNITY CONTRIBUTION AND ACADEMIC ACTIVITY

- Co-organize Music+AI Reading Group: [YouTube Channel](#) | [Google Group](#)
- ISMIR 2022 tutorial - T3(M): Designing Controllable Synthesis System for Musical Signals
- Poster presentation on ReaLchords at NEMISIG 2024 03/2024
- Talk on MIDI-DDSP at CMU music reading group 04/2022

## ACADEMIC REVIEW EXPERIENCE

- Neurips, ICLR, SIGGRAPH

## SELECTED AWARD

- [3<sup>rd</sup> 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
- 2nd Prize of Academic Scholarship (Top 15%) 2019
- Gold Price in Beijing University Orchestra Performance 2018