Mengyu Yang

Machine Learning · Computer Vision · Generative Modelling

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Education

University of Toronto *Toronto, Canada*

B.A.Sc. in Engineering Science with Honours (Specialization in Machine Intelligence) *Sep 2017 - Apr 2021*

Major GPA: 3.86/4.00 | CGPA: 3.62/4.00

Thesis: Building a Dataset for Music Analysis and Conditional Generation

Publications

TriBERT: Full-body Human-centric Audio-visual Representation Learning for Visual Sound Separation

- *Rahman, T.;* ***Yang, M.****; Sigal, L.* | NeurIPS 2021

Soloist: Generating Mixed-Initiative Tutorials from Existing Guitar Instructional Videos Through Audio Processing

- *Wang, B.;* ***Yang, M.****; Grossman, T.* | 2021 ACM Conference on Human Factors in Computing Systems (CHI '21)

Mask-Guided Discovery of Semantic Manifolds in Generative Models

- ***Yang, M.****; Rokeby, D.; Snelgrove, X.* | 4th Workshop on Machine Learning for Creativity and Design at NeurIPS 2020

Musical Speech: A Transformer-based Composition Tool

- *d'Eon, J.*; Dumpala, S.*; Sastry, C.*; Oore, D.;* ***Yang, M.****; Oore, S.* (*Equal contribution) | NeurIPS 2020 Demonstration Track

Research

Vector Institute for Artificial Intelligence

Research Assistant, Advised by Prof. Alireza Makhzani *Oct 2021 - Feb 2022*

- Worked on a few-shot generation model that implicitly models unseen support sets to generate samples based on only a few example images

Vector Institute for Artificial Intelligence

Research Intern, Co-advised by Prof. Leonid Sigal and Prof. Sageev Oore *May 2021 - Feb 2022*

- Designed and implemented cross-modal retrieval experiments for a multi-modal feature learning model, demonstrating its generalizability and the semantic meaningfulness of learned representations compared to baselines
- Developing a model that jointly learns cross-modal generation between video and audio, based on a GAN architecture guided by conditioning on learned features of the two modalities

Vector Institute for Artificial Intelligence

Undergraduate Thesis, Advised by Prof. Sageev Oore *Sep 2020 - May 2021*

- Built a dataset of solo piano recordings containing multi-track data of fundamental musical structural information, to address shortcomings faced by current deep learning music models which lack structural knowledge and cohesion
- Trained a Transformer model for harmonizing an input melody to use within a larger system that translates human voice into music

BMO Lab in Creative Research in the Arts, Performance, Emerging Technologies and AI

Research Intern, Advised by Prof. David Rokeby *May 2020 - Nov 2020*

- Designed an optimization-based method, guided by a custom objective function, to learn manifolds within the latent space of StyleGAN2 that correspond to localized changes in the output images (e.g. latent vectors within the manifold only change the mouth region of the same image of a face)
- Presented work as first author at the Workshop on Machine Learning for Creativity and Design at NeurIPS 2020

Dynamic Graphics Project, University of Toronto

Undergraduate Research Student, Advised by Prof. Tovi Grossman *Sep 2019 - Sep 2020*

- Created an algorithm that segments audio within guitar tutorial videos into musically meaningful phrases, used within a music learning system that allows guitar learners to easily navigate through the lesson
- Conducted a technical evaluation on the segmentation algorithm by developing tests to measure precision, recall, F1, and boundary similarity against human-labelled ground truths, with results exceeding baseline performance

Dynamic Graphics Project, University of Toronto

Undergraduate Research Student, Advised by Prof. Khai N. Truong *May 2019 - Sep 2019*

- Developed a webcam tool for face detection and pupil tracking to detect when the user has incorrect gaze response and head posture, implemented within a system for teaching piano sight reading
- Designed and implemented a dynamic-programming algorithm for identifying correctly played notes from noisy audio data, achieving **100%** accuracy on all testing examples

Experience

Teaching

Division of Engineering Science, University of Toronto

ESC101 & ESC102 Teaching Assistant *Sep 2019 - Apr 2020*

- Taught engineering design principles to classes of 20-30 students by leading individual group sessions
- Graded field note reports and core competency evaluations; provided feedback on design showcase presentations and suggested areas of improvement

Industry

StratumAI

Machine Learning Developer *Feb 2022 - Present*

- Develop and apply machine learning methods to create models for the mining industry

Honors & Awards

Academic

2017 - 2021 **Dean's Honours List ×6** *University of Toronto*

Scholarships

2017 **University of Toronto Scholar** *University of Toronto*

2017 **William Ian Mackenzie Turner 2T5 Admission Scholarship** *University of Toronto*

2017 **Faculty of Applied Science and Engineering Admission Scholarship** *University of Toronto*