

Mengyu Yang

MACHINE LEARNING · COMPUTER VISION · HUMAN-COMPUTER INTERACTION

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Education

University of Toronto

Toronto, Canada

B.A.Sc. in Engineering Science (Major in Machine Intelligence)

Sep 2017 - Apr 2021

Peer-Reviewed Publications

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

Undergraduate Thesis, Advised by Professor Sageev Oore

Sep 2020 - Present

- Building a jazz piano dataset using a custom processing pipeline to train a transformer model
- Designed and trained a neural net transformer that harmonizes an input melody, to use within a larger system that converts human voice into music

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

Research Intern

May 2020 - Nov 2020

- Experimented with different optimizers and designed custom loss functions for loss landscape exploration with the goal of generating animations of localized facial changes from StyleGAN2
- Designed an optimization-based method, guided by a physics-inspired loss function, to learn manifolds within the latent space of generative models corresponding to localized feature changes on the generated image

Dynamic Graphics Project, University of Toronto

Undergraduate Research Student, Advised by Professor Tovi Grossman

Sep 2019 - Sep 2020

- Created an algorithm that segments music within guitar tutorial videos into temporally localized 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 Professor 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

INDUSTRY

Salesforce

Intern

Sep 2020 - Dec 2020

- Leveraged BERT language models, k-means clustering, and text mining processes to identify trends in customer support correspondences and motivate internal process changes

TEACHING

Division of Engineering Science, University of Toronto

ESC101/102 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

LEADERSHIP

Dynamic Graphics Project, University of Toronto

Project Adviser for High School Student

Jul 2019 - Sep 2019

- Advised a high school student under a professor, holding regular meetings and providing advice for developing a method to translate measurement data from digital calipers to be used for real-time 3D modelling

Division of Engineering Science, University of Toronto

Student Ambassador

Sep 2018 - Present

- Represented the Engineering Science program in public outreach events, including the Ontario Universities Fair, Top Applicant Event, and EngSci Orientation, to answer questions and connect with students and families

Projects

Social Distancing Detection

2020

- Used homography, object detection models, and a custom-built optical flow-based tracking algorithm to detect social distancing violations from camera footage, accounting for social groups such as families, couples, etc.

Recurrent Neural Network for Sentiment Classification

2019

- Developed and trained a RNN architecture for sentiment analysis, classifying sentences as either objective or subjective by using Word2Vec embedding on a dataset of Rotten Tomatoes and IMDb posts

Honors & Awards

ACADEMIC

2017 - 2020 **Dean's Honour List** x5

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