

# Mengyu Yang

MACHINE LEARNING · COMPUTER VISION · HUMAN-COMPUTER INTERACTION

☎ (+1) 289-788-3818 | ✉ my.yang@mail.utoronto.ca | 🏠 mengyu.page | 📺 mengyu-yang

## Education

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**University of Toronto**

Toronto, Canada

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

Sep 2017 - Apr 2021

## Peer-Reviewed Publications, Workshops & Demos

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### **Soloist: Generating Mixed-Initiative Tutorials from Existing Music Instructional Videos Through Audio Processing**

- Wang, B., **Yang, M.**, Grossman, T. | Conditionally accepted to the 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

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### **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

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### INDUSTRY

#### **Salesforce**

##### **Intern**

Sep 2020 - Dec 2020

- Leveraged deep learning models, unsupervised learning techniques, and data science processes to discover trends in customer support correspondences to motivate internal process changes and improve chatbot technology

### 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 - Apr 2020

- 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

## Honors & Awards

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### ACADEMIC

2017 - 2020 **Dean's Honour List ×4**

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

## Projects

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#### **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

#### **Autonomous Tire-Stacking Robot**

2018

- Designed, prototyped, and fabricated circuits that controlled the movement and sensing of an automated robot, integrated with a PIC microcontroller