

Robert (Rupert) Wu

Updated October 4, 2022

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Education

Master of Science, University of Toronto (UofT)

Sept 2022 -

- Studies in Computer Science (Machine Learning)
- Supervisor: Prof. Vardan Papayan

Bachelor of Science (Honours), University of Toronto (UofT)

- **Victoria College** | **GPA: 3.75** (High Distinction)
Specialist in Computer Science (Focus: Artificial Intelligence)
Minor in Mathematics
- **Scarborough College** | **GPA: 3.81**
Studies in Computer Science, Mathematics, & Statistics

Sept 2018 - May 2022
conferred June 15, 2022

Sept 2017 - Aug 2018
transferred to Victoria College

Experience

Machine Learning Intern, Cohere

May - August 2022

Modelling - Embeddings; manager: Adrien Morisot; mentor: Amr Kayid

Undergraduate Research Assistant, Robot Vision & Learning (RVL) Lab, UofT

Oct 2021 - Jan 2022

Supervisor: Prof. Florian Shkurti (CSC495)

- Reviewed and augmented methods in continual learning for image classification to mitigate catastrophic forgetting.

Undergraduate Research Assistant, Department of Computer Science, UofT

Jan - May 2021

Supervisor: Prof. Sanja Fidler (CSC494)

- Developed a downstream application based on OpenAI CLIP with nearest-neighbours between images/text captions.

Software Development Engineer (SDE) Intern, Amazon Web Services (AWS)

June - Aug 2020

Simple Queue Service (SQS); manager: Jackie Li

Developer Intern, Interac

May - Aug 2019

Product & Technology; manager: Jordan Crombie

Software Developer Co-op, Hootsuite

Jan - Apr 2019

Hootsuite Impact; manager: Nirav Patel

Teaching

Course Instructor, University of Toronto

Course	Title	Co-Instructor(s)	Term
CSC209H5	Software Tools & Systems Programming	Arnold Rosenbloom, Bahar Aameri	Winter 2023
CSC207H5	Software Design	Sonya Allin	Fall 2022

Teaching Assistant, University of Toronto

Course	Title	Duties	Instructor	Term
CSC412/2506H1	Probabilistic Learning & Reasoning	(γ) (η)	Murat Erdogdu	Winter 2022
CSC413H5	Neural Networks & Deep Learning	(τ) (γ) (η)	Lisa Zhang, Florian Shkurti	Winter 2022
CSC311H5	Introduction to Machine Learning	(τ) (γ) (η)	Anthony Bonner, Lisa Zhang	Fall 2021
CSC165H1	Mathematics for Computer Science	(λ) (γ)	Francois Pitt	Winter 2020
CSC165H1	Mathematics for Computer Science	(λ) (γ)	David Liu	Winter 2019
CSC/MATA67H3	Discrete Mathematics	(τ) (γ) (η)	Anna Bretscher	Fall 2019
CSCA08H3	Introduction to Computer Science I	(η) (γ)	Anya Tafliovich	Fall 2018

(γ) grading (λ) lecture assistance (η) office/lab hours (τ) tutorials

Publications

1. Nayan Saxena, **Robert Wu**, & Rohan Jain (2022). Towards One Shot Search Space Poisoning in Neural Architecture Search (Student Abstract). *Proceedings of the 36th AAAI Conference on Artificial Intelligence*.
Pre-Print: <https://arxiv.org/abs/2111.07138>
2. **Robert Wu**, Nayan Saxena & Rohan Jain (2022). NeuralArTS: Structuring Neural Architecture Search with Type Theory (Student Abstract). *Proceedings of the 36th AAAI Conference on Artificial Intelligence (Top 20 Finalist, Oral)*.
Pre-Print: <https://arxiv.org/abs/2110.08710>
3. **Robert Wu***, Nayan Saxena* & Rohan Jain* (2021). Poisoning the Search Space in Neural Architecture Search. *Workshop on Adversarial Machine Learning, 38th International Conference on Machine Learning, 2021*.
Available at <https://openreview.net/forum?id=fB3z4GrHCYv>

* equal contribution

Other Projects

1. **Analysis of Heuristics for Neural Architecture Search**
Robert Wu (MAT496 Paper)
 - Paper: <https://www.cs.toronto.edu/~rupert/projects/nas-heuristics.pdf>
2. **QENAS: Q-Learning for Efficient Neural Architecture Search**
Robert Wu, Rohan Jain (CSC498 Project)
 - Paper: <https://www.cs.toronto.edu/~rupert/projects/q-learning-enas.pdf>
 - Code: <https://github.com/rusbridger/ENAS-Experiments/tree/qenas>
3. **Multimodal (OpenAI) CLIP Applications (Prototype)**
Robert Wu (CSC494 Project)
 - App Code: <https://github.com/rusbridger/Multimodal-CLIP-Applications>
 - Library Code: https://github.com/rusbridger/CLIP_FAISS_NNs
4. **Bayesian Filters State Estimation on Directed Graphs: On The Toronto Subway System**
Robert Wu, Roland Gao (CSC412/2506 Project)
 - Paper: <https://www.cs.toronto.edu/~rupert/projects/bayesian-filters.pdf>
 - Code: <https://github.com/rusbridger/Reasonable-Subway-Surfing>
5. **Comparing Image Captioning Results from CNN-LSTM and Nearest-Neighbor Approaches**
Shayan Khalili-Moghaddam*, Jiyu Nam*, Robert Wu* (CSC413/2516 Project)
 - Paper: <https://www.cs.toronto.edu/~rupert/projects/image-captioning.pdf>
 - Code: <https://github.com/rusbridger/Image-Captioning-Reproduction>
6. **Super-Resolution using Deep Learning**
Michal Fishkin*, Siddhant Jain*, Robert Wu* (CSC420 Project)
 - Paper: <https://www.cs.toronto.edu/~rupert/projects/super-resolution.pdf>
 - Code: <https://github.com/rusbridger/Super-Resolution-DL>
7. **C++/CUDA Implementation of Conway's Game of Life:** <https://github.com/rusbridger/Game-of-Life>
8. **utmist.gitlab.io:** <https://gitlab.com/UTMIST/utmist.gitlab.io>
9. **UTMIST Runner Bot:** <https://gitlab.com/UTMIST/MISTR>
10. **Unix Desktop Configuration:** <https://gitlab.com/rusbridger/dots>

* equal contribution

Academic Awards

University of Toronto

- Dean's List Scholar, Faculty of Arts & Science Winter 2022, Winter 2021, Summer 2019
- Dean's List Scholar, Scarborough College Summer 2018
- Entrance Scholarship (\$2000 CAD), Scarborough College Fall 2017

Graduate Coursework (University of Toronto)

Course	Title	Instructor	Term
CSC2224H1	Parallel Computer Architecture and Programming	Gennady Pekhimenko	Fall 2022
CSC2332H1	Quantum Algorithms	Nathan Wiebe	Fall 2022
MAT1510H1	Deep Learning: Theory & Data Science	Vardan Papyan	Fall 2022

Undergraduate Coursework (University of Toronto)

Course	Title	Instructor	Term
CSC488/2107H1	Compilers & Interpreters	Fan Long	Winter 2022
MAT496H1	Reading: Mathematics of Deep Learning	Vardan Papyan	Winter 2022
VIC493H1	Vic Capstone Research Colloquium	Emanuel Istrate	Year 2021-2022
CSC485/2501H1	Computational Linguistics	Gerald Penn	Fall 2021
CSC495H1	Project: Continual Learning	Florian Shkurti	Fall 2021
CSC498/475H5	Topics: Introduction to Reinforcement Learning	Animesh Garg	Fall 2021
CSC384H1	Introduction to Artificial Intelligence	Sonya Allin	Summer 2021
CSC412/2506H1	Probabilistic Learning & Reasoning	Jesse Bettencourt	Winter 2021
CSC413/2516H1	Neural Networks & Deep Learning	Jimmy L. Ba, Bo Wang	Winter 2021
CSCD70H3	Compiler Optimizations	Gennady Pekhimenko	Fall 2020
CSC494H1	Project: Multimodal CLIP Applications	Sanja Fidler	Winter 2021
CSCC11H3	Introduction to Machine Learning & Data Mining	Bryan Chan	Fall 2020
CSC369H1	Operating Systems	Karen Reid	Fall 2020
CSC420H1	Introduction to Image Understanding	Babak Taati, Morteza Rezanejad	Fall 2020
LAT101H1	Introductory Latin I	Anthony Antunes	Summer 2020
CSC258H1	Computer Organization	Marshall Ho	Winter 2020
HPS391H1	History of Mathematics from 1700 to the Present	Sylvia Nickerson	Winter 2020
MAT224H1	Linear Algebra II	Sean Uppal	Winter 2020
CSC209H1	Software Tools & Systems Programming	Karen Reid	Fall 2019
CSC324H1	Principles of Programming Languages	David Liu	Fall 2019
CSC373H1	Algorithm Design, Analysis, & Complexity	Koushik Pal	Summer 2019
CSC300H1	Computers & Society	Mathew Zaleski, Ishtiaque Ahmed	Winter 2019
CSC207H1	Software Design	Paul Gries, Lindsey Shorser	Fall 2018
CSC263H1	Data Structures & Analysis	Bahar Aameri	Fall 2018
CSC336H1	Numerical Methods	Kenneth R. Jackson	Fall 2018
CLA201H1	Greek & Latin in Scientific Terminology	Marion Durand	Summer 2018
CSCB36H3	Introduction to the Theory of Computation	Nick Cheng	Summer 2018
MAT223H1	Linear Algebra I	Steven D. Amelotte	Summer 2018
MAT235Y1	Multivariable Calculus	Faisal Al-Faisal	Summer 2018
STA247H1	Probability with Computer Applications	Karen H. Wong	Summer 2018
CSCA48H3	Introduction to Computer Science II	Nick Cheng	Winter 2018
EESA06H3	Introduction to Planet Earth	Nick Eyles	Winter 2018
MATA37H3	Calculus for Mathematical Sciences II	Kathleen Smith	Winter 2018
PHLA11H3	Introduction to Ethics	Waheed Hussain	Winter 2018
CSCA08H3	Introduction to Computer Science I	Brian Harrington	Fall 2017
CSC/MATA67H3	Discrete Mathematics	Anna Bretscher, Richard Pancer	Fall 2017
MATA31H3	Calculus for Mathematical Sciences I	Natalia Breuss	Fall 2017
MGTA01H3	Introduction to Business	Chris Bovaird	Fall 2017
VPMA95H3	Elementary Musicianship	Noah Lemish	Fall 2017

Affiliations

Cohere For AI

- Community Member *June 2022 -*

ML Collective

- Community Member *Sept 2021 -*

University of Toronto Machine Intelligence Student Team (UTMIST)

- Co-Founder & Director, Automated Machine Learning Group (AutoMLG) *Sept 2021 -*
 - Founded an independent group affiliated with UTMIST that explores automated machine learning. Members have worked on topics at the intersection of combinatorial optimisation, type theory and neural architecture search (NAS).
 - Facilitated open collaboration and built a culture of open, cross-institutional research collaboration among researchers of diverse and non-traditional backgrounds. Our main external collaborators are the ML Collective lab, George (Alexandru) Adam (Vector Institute; University of Toronto) and Dr. Chuan-Yung Tsai (Vector Institute).
- Student Advisor *May 2021 -*
- Co-President, with Yixuan (Richard) Xu *July 2020 - July 2021*
- Vice-President of Engineering/Infrastructure *Jan 2020 - Jan 2021*
- Web Developer *Aug 2019 - Dec 2019*

Computer Science Student Union (CSSU), UofT

- President (Interim) *Apr - May 2022, Oct - Dec 2021*
- Vice-President *May 2021 - May 2022*
- Orientation Student Leader *Aug - Sept 2020*
- Orientation Organizer *July - Sept 2019, May - Sept 2018*

Victoria College Council (VCC), UofT

- Student Councillor *Oct 2021 - Apr 2022*