

EXPERIENCE

Google Research, Brain Team

Mountain View, CA, USA

Research Scientist Intern with Senior Scientist Igor Mordatch

2021-10 – ongoing

Develop prescriptive sequential learning frameworks to enable creative robotic decision making in real and simulation.

*Topics: sequential decision making, language representation, reinforcement learning, probabilistic inference***Stanford University, Stanford AI Lab**

Toronto, Canada

Visiting Research Scholar with Prof. Stefano Ermon

2021-06 – ongoing

Improve likelihood and sample quality of score-based generative models through general and efficient SDE optimization.

*Topics: Score-based generative models, SDEs, EBMs, diffusion probabilistic models, latent variable models***Cohere & Oxford University, Machine Learning Research**

Toronto, Canada

Machine Learning Researcher with Nick Frost, Aidan Gomez, and Yarin Gal

2021-01 – 2021-06

Develop data efficient algorithms to improve training cost and personalization of billion parameter language models.

*Topics: Transformers, attention, distillation, curriculum learning, uncertainty***Nvidia, Simulations & Robotics Team**

Toronto, Canada

Deep Learning Research Intern with Gavriel State and Prof. Animesh Garg

2020-08 – 2020-12

Build performant GPU-accelerated environments towards time / resource efficient reinforcement learning for robotics.

*Topics: Omniverse, IsaacGym, robotics, reinforcement learning***Vector Institute & University of Toronto**

Toronto, Canada

Undergraduate Researcher with Prof. David Duvenaud

2020-01 – Present

Improve generalization and robustness of Neural Ordinary Differential Equations by modelling uncertainty with SDEs.

*Topics: ordinary/stochastic differential equations, Bayesian neural networks, variational inference, JAX***FOR.ai**

Toronto, Canada

Machine Learning Research Lead

2019-07 – Present

Explore sparsity and low-rank parameterizations to efficiently train heavily parameterized neural language models.

*Topics: progressive growth neural networks, low-rank factors, efficient network architectures*EDUCATION

University of Toronto

2017–2020, 2021–2022

HBASc Candidate in Computer Science, Statistics, Math

Dean's List Scholar

Coursework (graduate-level): NLP, machine learning, deep learning I & II, probabilistic reasoning, stochastic processes

Teaching Assistant: CSC258 (Intro. Computer Systems)

PEER-REVIEWED PUBLICATIONS

- [5] Michael Poli*, **Winnie Xu***, Chenlin Meng, and Stefano Ermon, “The self-similarity prior: Fractal patch representations for generative models,” In Preparation, 2022.
- [4] Yang Song*, **Winnie Xu**, and Stefano Ermon, “Noise invariant score-based generative models through learnable SDEs,” In Preparation, 2022.
- [3] Soon Hoe Kim, N. Benjamin Erichson, Francisco Utrera, **Winnie Xu**, and Michael Mahoney, “Noisy feature mixup,” Under Review at ICLR 2022, 2021.
- [2] †Sören Mindermann*, Muhammed Razzak*, **Winnie Xu***, Andreas Kirsch, Mrinank Sharma, Aidan N. Gomez, Sebastian Farquhar, Jan Brauner, and Yarin Gal, “Prioritized training on points that are learnable, worth learning, and not yet learned,” *Workshop in Subset Selection in ML*, ICML, 2021.
- [1] **Winnie Xu**, Ricky T.Q. Chen, Xuechen Li, and David Duvenaud, “Infinitely deep bayesian neural networks with stochastic differential equations,” *Workshop in Bayesian Deep Learning*, NeurIPS, 2020.

HONORS, AWARDS, AND GRANTS

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| Undergraduate Research Award Finalist , Computing Research Association | 2021 |
| Axelrad Research Award (Best Project) , Princess Margaret Cancer Research | 2018 |
| Summer Undergraduate Research Award , University of Toronto | 2018 |
| 1st Place Sanofi Biogenius & Silver Medal Canada-Wide Science Fair , Science Fairs Canada | 2017 |

SERVICE

Reviewer, *International Conference on Learning Representations, Journal of Machine Learning Research* 2021