Winnie Xu

winniexu@cs.toronto.edu
winniexu.ca

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

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