Winnie Xu

winniexu@cs.toronto.edu
winniexu.ca

Experience

Google Research, **Brain Team** — Mountain View, CA, USA
Research Intern with Scientist Igor Mordatch — 2021-10 – ongoing
(1) Improve Decision Transformer models to extrapolate in creative and general ways in embodied game play and protein prediction problems. (2) Enable 3D neural implicit scene representations with diffusion models.
Topics: sequence modeling, Transformers, language representation, reinforcement learning, biology

Stanford University, **Stanford AI Research** — Menlo Park, CA, USA
Visiting Research Scholar with Prof. Stefano Ermon — 2021-06 – ongoing
(Fall 2021) Develop self-referential operators for fractal data encoding, efficient compression, and creative generation.
(Summer 2021) Derive noise-invariant score-based generative models with improved likelihood and sample quality.
Topics: sequential decision making, language representation, reinforcement learning, probabilistic inference

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

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 large pre-trained 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

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: machine learning, deep learning I/II, statistical reasoning, stochastic processes, NLP, computer vision
Teaching Assistant: CSC258 (Intro. Computer Systems)

Peer-Reviewed Publications

[4] Soon Hoe Kim, N. Benjamin Erichson, Francisco Utrera, **Winnie Xu**, and Michael Mahoney, "Noisy feature mixup," International Conference on Learning Representations, 2022.

[3] **Winnie Xu**, Ricky T.Q. Chen, Xuechen Li, and David Duvenaud, "Infinitely deep bayesian neural networks with stochastic differential equations," International Conference on Artificial Intelligence and Statistics, 2022.

[2] **Winnie Xu***, Michael Poli*, Stefano Massaroli, Chenlin Meng, Kuno Kim, and Stefano Ermon, "Self-similarity priors: Neural collages as differentiable fractal representations," Under Review, 2022.

[1] **Winnie Xu***, Sören Mindermann*, Muhammed Razzak*, 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.

Honors, Awards, and Grants

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