Winnie Xu

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Experience

Cohere & Oxford University, **Machine Learning Research** — Toronto, Canada
Machine Learning Researcher with Nick Frost, Aidan Gomez, and Yarin Gal — 2021-01 – Present
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 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

Google, **Brain Team** — Mountain View, CA, USA
Software Engineering Intern — 2020-05 – 2020-08
Actualize state of the art pre-/post-hoc pruning methods for easy experimentation and efficient hardware computation.
Topics: lottery tickets, dynamic sparsity, Tensorflow Model Optimization Toolkit (top contributor)

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, latent variable models, stochastic optimization, JAX (contributor)

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
BASc Candidate in Computer Science, Statistics, Math
Coursework: NLP (graduate-level), Deep learning (graduate-level), Probabilistic Machine Learning (graduate-level), Stochastic Processes, Algorithms & Data Structures, Calculus, Complex Analysis, Linear Algebra
Teaching Assistant: CSC258 (Intro. Computer Systems)
Pre-medicine (2017 – 2018): Molecular/Evolutionary Biology, Physical/Organic Chemistry, Genetics

Publications

[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

Undergraduate Student Research Award, NSERC [*declined*] — 2020
Trinity College Scholarship, University of Toronto — 2019
Axelrad Research Award (Best Project), Princess Margaret Cancer Research — 2018
Summer Undergraduate Research Award, University of Toronto — 2018
Top 15% Distinction, Canadian National Mathematics Contest — 2015, 2016, 2017
1st Place Honours, Sanofi Biogenius Canada — 2017
Silver Medal (Top 20), Canada-Wide Science Fair — 2017

Projects

Computational Biology Research, **Princess Margaret Cancer Research** — 2018-05 – 2018-09
Develop annotation pipelines and unsupervised learning techniques to predict cancer-linked epigenetic factors.
HiRide Inc. (acquired by Facedrive) — 2019-06 – 2020-01
Full stack developer, chatbot lead for user-facing mobile product.

Skills

Languages: Python, Golang, C/C++, Bash, Java, Javascript, R, LaTeX
Tools: JAX, TensorFlow, Pytorch, Numpy, Linux, Docker, React, Google Cloud Platform, Slurm