JACOB KELLY

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EDUCATION

University of Toronto — Toronto, CA
HBSc, Computer Science, Math · ***cGPA: 3.94/4 Course Average: 90%*** — Sep 2017 – Jun 2022
Recipient of more than $20,000 in scholarship and grant funds.

Graduate Courses:	Machine Learning · Random Processes · Information Theory · Numerical Methods
Undergrad Courses:	Randomized Algorithms · Optimization · Graphics · ODEs · Molecular Biology
Teaching Assistant:	STA414/2104 (Grad. Machine Learning II) · Office hours and assignment grading

EXPERIENCE

Research Engineer · Python · JAX — London, UK
DeepMind — Jul 2022 – Present

- Working on the Core Research Engineering team.

Machine Learning Researcher · Python · JAX · PyTorch · Bash · Git · SLURM — Toronto, CA
Vector Institute for AI — Sep 2019 – Apr 2022
Supervisors: David Duvenaud, Richard Zemel, Roger Grosse

- Worked on regularizing Neural Ordinary Differential Equations, generative modelling with Energy Based Models, and analysis of eigenspectra using Kronecker-Factored Approximate Curvature.

Machine Learning Research Intern · Python · TensorFlow · pandas · Bash · Git — Toronto, CA
Deep Genomics — Sep 2020 – Apr 2021

- Developed framework for compressing deep convolutional splicing models with neural distillation. Resulting models matched performance across tasks and metrics while 3.7x smaller and 3.3x faster.

Computational Biology Researcher · R · MATLAB · Bash · Git — Toronto, CA
Princess Margaret Cancer Research · Supervisor: Benjamin Haibe-Kains — Apr 2019 – Sep 2019

- Developed R package for benchmarking machine learning methods for inferring sample-specific gene regulatory networks from single-cell RNA sequencing (scRNA-Seq) data.

PAPERS

1. **J. Kelly**, R. Zemel, W. Grathwohl
   "Directly Training Joint Energy-Based Models for Conditional Synthesis and Calibrated Prediction".
   ICML Workshop on Uncertainty & Robustness in Deep Learning 2021

2. W. Grathwohl*, **J. Kelly***, M. Hashemi, M. Norouzi, K. Swersky, D. Duvenaud
   "No MCMC for me: Amortized sampling for fast and stable training of energy-based models".
   International Conference on Learning Representations (ICLR) 2021

3. **J. Kelly***, J. Bettencourt*, M. J. Johnson, D. Duvenaud
   "Learning Differential Equations that are Easy to Solve".
   Neural Information Processing Systems (NeurIPS) 2020

PROJECTS

JAX (Open-source contributor) · Python · Git — github.com/google/jax

- Top 10% of contributors (25 commits, ~ 1000 lines of code). Derived and implemented numerically stable Taylor-mode automatic differentiation rules. Wrote numerical tests and fixes for ODE solvers.

SERVICE

Reviewer, NeurIPS, ICLR, ICML	2021, 2022
IEEE Transactions on Neural Networks and Learning Systems, Reviewer	2021
ICLR 2021 Energy-Based Models Workshop, Programme Committee (Reviewer)	2021

AWARDS

Undergraduate Researcher Award (Finalist), Computing Research Association (CRA)	2022
Undergraduate Student Research Award, NSERC Canada	2020
Dorothy Helen McRobb Scholarship	2019, 2022
David L. Squires Foundation Scholarship	2019
Margaret Ronald & Thomas Paxton Taylor Scholarship in Mathematics	2019
Distinction (Top 15%), Euclid National Mathematics Contest, Univ. of Waterloo	2017
Top 10, ECOO Central Ontario Programming Contest	2017

SKILLS

Languages/Tools:	Python · Bash · Git · MATLAB · LaTeX · C/C++ · R · Java
Frameworks:	PyTorch · JAX · TensorFlow · Keras · NumPy · pandas · scikit-learn