

Ekansh Sharma

CONTACT INFORMATION

Email: ekansh@cs.toronto.edu
Website: <https://ekanshs.github.io/>
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EDUCATION

University of Toronto, Toronto, ON, Canada
Doctor of Philosophy, Computer Science, expected 2025
Thesis: *Exploiting linear connectivity modulo permutations in neural networks for parsimonious machine learning*
Adviser: Prof. Daniel M. Roy

University of Toronto, Toronto, ON, Canada
Master of Science, Computer Science, conferred 2018
Thesis: *Sparse exchangeable bi-partite graphs*
Adviser: Prof. Daniel M. Roy

University of Toronto, Toronto, ON, Canada
Bachelor of Applied Science with Honors, Electrical Engineering, conferred 2016
Minor in Robotics and Mechatronics

PROFESSIONAL EXPERIENCE

Vector Institute, Toronto, ON, Canada
Graduate Research Student *Fall 2018 - Present*
Adviser: Prof. Daniel M. Roy
Research Interests: Deep learning; Transfer learning; Model compression.

Amazon.com, Edinburgh, UK
Applied Scientist Intern *Winter 2021*
Sponsored Display (Ads team)

- Developed counterfactual analysis tools to assess the impact of different ad selection policies aimed at reducing costs for running explicit A/B tests.
- Conducted A/B tests to compare the performance of Upper Confidence Bound (UCB) algorithms against existing baseline ad selection methods at Amazon, measuring click-conversion rate.

Altera Corp., Toronto, ON, Canada
Software Engineering Intern *Fall 2014, Winter 2015*
Detailed Placement Team

- Modeled bidirectional long wire congestion on the chip to get better wire use estimate during placement.
- Parallelized code segments in *Versatile Place and Route* to improve compile time.

Microsoft Corp., Redmond, WA, USA
Software Development Engineering Intern *Summer 2014*
Azure Redis Cache Team

- Developed Redis output-cache provider feature for ASP.NET developers.
- Developed a command line prompt to access Redis Cache on Azure Portal.

PREPRINTS

Sharma E., Roy D.M., Dziugaite G. K.. “The non-local merging problem: Permutation symmetries and variance collapse.” *arXiv preprint [arXiv:2410.12766](https://arxiv.org/abs/2410.12766)*.

REFEREED
PUBLICATIONS

Sharma E., Kwok D., Denton T., Roy D.M., Rolnick D., Dziugaite G. K.. “Simultaneous linear connectivity of neural networks modulo permutation.” *Joint European Conference on Machine Learning and Knowledge Discovery in Databases*. Cham: Springer Nature Switzerland, 2024 ([link](#)).

Naulet Z., Roy D.M., **Sharma E.**, Victor Veitch. “Bootstrap estimators for the tail-index and for the count statistics of graphex processes”, *Electronic Journal of Statistics, Electron. J. Statist.* 15(1), 282-325, 2021 ([link](#)).

REFEREED
CONFERENCE
ABSTRACTS AND
PRESENTATIONS

Jain, R., Adnan, M., **Sharma, E.**, Ioannou, Y. “Winning Tickets from Random Initialization: Aligning Masks for Sparse Training.” Presented at the *UniReps: 2nd Edition of the Workshop on Unifying Representations in Neural Models*. co-located with NeurIPS 2024. Vancouver, Canada ([link](#)).

Sharma E., Kwok D., Denton T., Roy D.M., Rolnick D., Dziugaite G. K. “Simultaneous linear connectivity of neural networks modulo permutation.” Presented at the *Conference on Parsimony and Learning*, Spotlight Track 2024. Hong Kong, China ([link](#)).

Singh D., **Sharma E.** , Roy D. M., Dziugaite G.K. “Flat minima can fail to transfer to downstream tasks.” Presented at the *PAC-Bayes meets Interactive Learning Workshop* co-located with ICML 2023. Hawaii, USA ([link](#)).

Sharma E., Roy D. M.. “Approximations in Probabilistic Programs: a Compositional Nonasymptotic analysis of Nested MCMC” Presented at the *ProbProg 2020* Cambridge, Massachusetts, USA ([poster](#), [talk](#)).

Sharma E., Roy D. M.. “Auxiliary variables in probabilistic programs.” Presented at the *Probabilistic Programming Systems Workshop (PPS 2018)* co-located with POPL2018. Los Angeles, California, USA. ([slides](#))

Erdman L, **Sharma E.**,Unternahrer E., Dass S.H., ODonnell K., Mostafavi S., Edgar R., Kobor M., Gaudreau H., Meaney M. and Goldenberg A.. “Modeling trajectories of mental health: challenges and opportunities.” Presented at the *In NeurIPS Workshop Machine Learning for Health 2016*, Barcelona, Spain ([link](#)).

TECHNICAL
REPORTS

Sharma E., Roy D. M.. “Approximations in Probabilistic Programs.” *arXiv preprint arXiv:1912.06791*. ([poster](#))

Veitch, V., **Sharma, E.**, Naulet, Z., Roy, D. M. (2017). “Exchangeable modelling of relational data: checking sparsity, train-test splitting, and sparse exchangeable Poisson matrix factorization.” *arXiv preprint arXiv:1712.02311*. ([slides](#))

UNDERGRADUATE
RESEARCH
PROJECTS

Autonomous Wing Assembly Process
Multidisciplinary Capstone Project

- Client: **Bombardier Aerospace**, North York, ON
- Adviser: Prof. Jonathan Kelly
- Designed and built a functioning prototype of an autonomous robot to join two wing halves for Global Express 7000/8000 series of business jets.

Efficient implementation of a graphical model for identifying disease mechanisms in complex human diseases

- Adviser: Prof. Anna Goldenberg
- Implemented a graphical model that combines multiple sources of genetic and genomic data to identify sets of genes that could explain the presence of a disease in a larger number of patients.
- Changed the structure of graphical model that resulted in 40% run-time savings.

Extending the user-space implementation of online filesystem consistency checker using Linux KVM

- Adviser: Prof. Ashvin Goel
- Worked on RECON, an online filesystem consistency checker.
- Extended the user-space implementation of RECON to use Linux KVM.

AWARDS AND HONORS	Vector Research Grant	2018-2024
	Department of Computer Science 50th Anniversary Graduate Scholarship	2017
	University of Toronto Excellence Award	2013, 2015
	Dean's Honors List	2011-2016
SKILLS	<i>Programming Languages:</i> Python, C,C++,C#, Java <i>Deep-learning frameworks:</i> JAX, PyTorch, Tensorflow	
TEACHING ASSISTANTSHIP	Machine Learning (CSC2515)	Fall 2019, Fall 2021, Fall 2022
	Data Structures and Analysis (CSC263)	Fall 2018
	Enriched Theory of Computation (CSC240)	Winter 2018
	Theory of Computation (CSC236)	Winter 2019, Winter 2017, Fall 2016
RELEVANT COURSEWORK	Statistical Learning Theory; Graphs, Matrices, and Optimization; Algorithms for Private Data Analysis; Monte Carlo Methods; Computability and Logic; Compilers and Interpreters; Computational Neuroscience; Machine Learning; Inference Algorithms; Random Processes; Neural Networks; Robot Modeling and Control.	
ACADEMIC SERVICES	Served as a reviewer for ICLR 2020, ICLR 2021, NeurIPS2021, ICLR 2022 NeurIPS 2022, ICLR 2023, ICML 2023, NeurIPS 2023, ICML2024, ICML 2025.	