Ekansh Sharma

CONTACT
INFORMATION

Email: ekansh@cs.toronto.edu
Website: http://www.cs.toronto.edu/~ekansh
GitHub: https://github.com/ekanshs

EDUCATION

University of Toronto, Toronto, ON, Canada
Doctor of Philosophy, Computer Science, expected 2024
Adviser: Prof. Daniel M. Roy

University of Toronto, Toronto, ON, Canada
Master of Science, Computer Science, conferred 2018
Thesis title: 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

PREPRINTS

Sharma E., Roy D.M., Dziugaite G. K.. "The non-local merging problem: Permutation symmetries and variance collapse." *arXiv preprint arXiv: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, Massachussetts, 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).

<table>
<tr><td>TECHNICAL
REPORTS</td><td>**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)</td></tr>
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PROFESSIONAL
EXPERIENCE

Amazon.com, Edinburgh, UK
Applied Scientist Intern   *Winter 2021*
Sponsored Display (Ads team)
- Developed counterfactual analysis tools for analysing policies for Ad selection.
- Developed A/B tests to compare UCB algorithm against baselines at Amazon.

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.

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*

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.