Lazar Atanackovic

Ph.D. Candidate · Machine Learning

University of Toronto & Vector Institute
The Edward S. Rogers Sr. Department of Electrical
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Summary

I am a machine learning researcher focusing on developing artificial intelligence to solve problems in science. I build efficient data-driven approaches across scientific domains with a particular interest in computational biology. My research expertise is in generative modelling (flows and diffusion), dynamical systems, and single-cell biology.

Education

University of Toronto, (UofT), Toronto, ON
(2020 - present) Ph.D., Electrical & Computer Engineering, Supervisors: *Dr. Brendan Frey, Dr. Bo Wang*
(expected completion May 2025)

University of British Columbia, (UBC), Vancouver, BC
(2018 - 2020) M.A.Sc, Electrical & Computer Engineering, Supervisor: *Dr. Lutz Lampe*
(2014 - 2018) B.A.Sc, Electrical Engineering, *with Distinction*

Grants & Fellowships

Ontario Graduate Scholarship (UofT)	2024
Vector Institute Student Research Grant (UofT)	2020 - present
Edward S. Rogers Sr. Graduate Scholarship (UofT)	2020 - present
School of Graduate Studies Conference Grant (UofT) (*respectfully declined*)	Fall 2023, Winter 2023
NSERC Canadian Graduate Scholarship – Doctoral (UofT)	2022-2023
NSERC Post Graduate Scholarship – Doctoral (UofT)	2020-2022
Graduate Support Initiative (UBC)	2018 & 2019
British Columbia Graduate Scholarship (UBC)	2019
NSERC Canadian Graduate Scholarship - Masters (UBC)	2018
NSERC Undergraduate Student Research Award (UBC)	2017

Honours & Awards

NeurIPS Top Reviewer	2024
Best Student Paper Award ISPLC	2018
UBC Electrical & Computer Engineering Capstone Industry Award (final year project)	2018
Charles Lindsay Thompson Scholarship	2018
Captain C.Y. Wu Scholarship	2018
B.A.Sc. Dean's Honour List (UBC)	2016, 2017, 2018
Port Coquitlam Minor Hockey Scholarship	2014

Research and Industry Experience

Deep Genomics, Toronto, ON — Nov 2024 - Feb 2025
Machine Learning Intern

Vector Institute, Toronto, ON — 2020 - present
Graduate Student Researcher

University Health Network, Toronto, ON — Oct 2024 - present
Research Trainee, Peter Munk Cardiac Center Artificial Intelligence

King's College London, London, UK — Jun 2024
Visiting Student Researcher, Faculty of Life Sciences and Medicine

Valence Labs / Recursion Pharmaceuticals, Montreal, QC — Sep 2023 - Feb 2024
Machine Learning Research Intern

Mila - The Quebec AI Institute / University of Montreal, Montreal, QC — May 2022 - Aug 2022
Research Intern, Dept. of Computer Science & Operations Research

University of Haifa, Haifa, Israel — May 2019
Visiting Student Researcher, Acoustic and Navigation Lab

University of British Columbia, Vancouver, BC — May 2017 - Aug 2017
Undergraduate Research Assistant, Dept. of Electrical & Computer Engineering

Pre-prints

[1] **Atanackovic L.**, Bengio E., *Investigating Generalization Behaviours of Generative Flow Networks*, arXiv preprint arXiv:2402.05309, 2024 **[in review]** Transactions on Machine Learning Research (TMLR)

Peer-reviewed Conference & Journal Publications

[1] Skreta M.*, **Atanackovic L.***, Bose J., Tong A., Neklyudov K., *The Superposition of Diffusion Models Using the Itô Density Estimator*, International Conference on Learning Representations (ICLR), 2025 [to appear]

[2] **Atanackovic L.***, Zhang X.*, Amos B., Blanchette M., Lee L., Bengio Y., Tong A., Neklyudov K., *Meta Flow Matching: Integrating Vector Fields on the Wasserstein Manifold*, International Conference on Learning Representations (ICLR), 2025 [to appear]

[3] Neklyudov K.*, Brekelmans R.*, Tong A., **Atanackovic L.**, Liu Q., Makhzani A., *A Computational Framework for Solving Wasserstein Lagrangian Flows*, International Conference on Machine Learning (ICML), 2024

[4] Tong A.*, Malkin N.*, Fatras K.*, **Atanackovic L.**, Zhang Y., Huguet G., Wolf G., Bengio Y., *Simulation-Free Schrodinger Bridges via Score and Flow Matching*, Artificial Intelligence and Statistics (AISTATS), 2024

[5] **Atanackovic L.***, Tong A.*, Wang B., Lee L. J., Bengio Y., Hartford J., *DynGFN: Towards Bayesian Inference of Gene Regulatory Networks with GFlowNets*, Advances in Neural Information Processing Systems (NeurIPS), 2023

[6] Liu T., Fradkin P., **Atanackovic L.**, Lee L. J., *Energy-based Modelling For Single-cell Data Annotation*, Machine Learning in Computational Biology (MLCB), 2022

[7] Fradkin P., Young A., **Atanackovic L.**, Lee L. J., Frey B., Wang B., *A Graph Neural Network Approach to Molecule Carcinogenicity Prediction*, Bioinformatics, vol. 38, pp. i84-i91, 2022 – presented at ISMB

[8] **Atanackovic L.**, Lampe L., Diamant R., *Deep-learning Based Ship-radiated Noise Suppression for Underwater Acoustic OFDM Systems*, IEEE/MTS OCEANS, 2020

[9] **Atanackovic L.**, Vakilian V.*, Wiebe D.*, Lampe L., Diamant R., *Stochastic Ship-radiated Noise Modelling via Generative Adversarial Networks*, IEEE/MTS OCEANS, 2020

[10] **Atanackovic L.**, *Machine Learning Inspired Ship-radiated Noise Modelling And Cancellation for Underwater Acoustic Communication Systems*, Masters Thesis, *UBC*, 2020

[11] **Atanackovic L.**, Zhang R., Lampe L., Diamant R., *Statistical Shipping Noise Characterization and Mitigation for Underwater Acoustic Communications*, IEEE/MTS OCEANS, 2019

[12] Huo Y., Prasad G., **Atanackovic L.**, Lampe L., Leung V. C. M., *Cable Diagnostics with Power Line Modems for Smart Grid Monitoring*, IEEE Access, vol. 7, pp. 60206-60220 2019

[13] Huo Y., Prasad G., **Atanackovic L.**, Lampe L., Leung V. C. M. *Grid Surveillance and Diagnostics Using Powerline Communications*, International Symposium on Power Line Communications (ISPLC), 2018 ***(Best Student Paper Award)***

Workshop Posters & Presentations

[1] **Atanackovic L.**, Bengio E., *Investigating Generalization Behaviours of Generative Flow Networks*, ICML Wokrshop on Structured Probabilistic Inference and Generative Modeling (SPIGM), 2024 **[*Oral*]**

[2] **Atanackovic L.***, Zhang X.*, Amos B., Blanchette M., Lee L., Bengio Y., Tong A.**, Neklyudov K.**, *Meta Flow Matching: Integrating Vector Fields on the Wasserstein Manifold*, ICML Workshop on Geometry-grounded Representation Learning and Generative Modeling (GRaM), 2024

[3] Neklyudov K., Brekelmans R., Tong A., **Atanackovic L.**, Liu Q., Makhzani A., *A Computational Framework for Solving Wasserstein Lagrangian Flows*, NeurIPS Workshop on Optimal Transport and Machine Learning, 2023

[4] Tong A., Malkin N., Fatras K., **Atanackovic L.**, Zhang Y., Huguet G., Wolf G., Bengio Y., *Simulation-Free Schrodinger Bridges via Score and Flow Matching*, ICML Workshop on Frontiers in Learning, Control, and Dynamical Systems, 2023

[5] Tong A.*, **Atanackovic L.***, Hartford J., Bengio Y., *Bayesian Dynamic Causal Discovery*, NeurIPS Workshop on Causal Dynamic Systems, 2022

[6] Liu T., Fradkin P., **Atanackovic L.**, Lee L. J., *Energy-based Modelling For Single-cell Data Annotation*, NeurIPS Workshop on Learning Meaningful Representations for Life (LMRL), 2022

[7] Fradkin P.*, **Atanackovic L.** *, Zhang M. R.*, *Robustness to Adversarial Gradients: A Glimpse into the Loss Landscape of Contrastive Pre-training*, ICML Workshop on Pre-training, 2022

[8] Fradkin P., Young A., **Atanackovic L.**, Lee L. J., Frey B., Wang B., *A Graph Neural Network Approach to Molecule Carcinogenicity Prediction*, Machine Learning in Computational Biology (MLCB) & NeurIPS Workshop on Learning Meaningful Representations for Life (LMRL), 2021

[9] Zhang R., Lampe L., Zhao H., *Sparsity-based Shipping Noise Analysis and Cancellation in Underwater Acoustic Communication*, Acoustical Society of America (ASA), 2018 **(Presenter: Atanackovic L. on behalf of Lampe L.)**

Invited Talks

- "Meta Flow Matching: Integrating Vector Fields on the Wasserstein Manifold". Learning on Graphs and Geometry (LoGG). Virtual. (October 2024)
- "DynGFN: Towards Bayesian Inference of Gene Regulatory Networks with GFlowNets". Helmholtz AI Conference 2024. Dusseldorf, Germany. (June 2024)

Teaching Experience

University of Toronto, Toronto, ON
Teaching Assistant, ECE 244 - Programming Fundamentals, 2022
Teaching Assistant, ECE 421 - Introduction to Machine Learning 2022

University of British Columbia, Vancouver, BC
Teaching Assistant, ELEC 311 - Electromagnetic Fields and Waves 2020
Teaching Assistant, ELEC 221 - Signals and Systems 2019
Teaching Assistant, CPEN 211 - Introduction to Microcomputers 2018, 2019
Undergraduate Teaching Assistant, CPEN 211 - Introduction to Microcomputers 2016, 2017

Student Supervision Experience

Undergraduate Thesis Supervisor (UofT)
Student now Software engineer at Ramp. 2021 - 2022
Co-supervised an undergraduate honours thesis student under Brendan Frey.
Resulted in completion of honours undergraduate thesis.

Undergraduate Research Supervisor (UBC)
Student now Applied Scientist at Apera AI. 2020
Co-supervised undergraduate research experience program under Lutz Lampe.
Resulted in IEEE/MTS OCEANS co-authorship.

Undergraduate Research Supervisor (UBC)
Student now Graduate Student at UBC. 2020
Co-supervised undergraduate research experience program under Lutz Lampe.
Resulted in IEEE/MTS OCEANS co-authorship.

Undergraduate Thesis Supervisor (UBC)
Co-supervised an undergraduate honours thesis student under Lutz Lampe. 2019
Resulted in completion of honours undergraduate thesis.

Academic Service

Reviewer

ICML (2025), ICLR (2025), AISTATS (2025), NeurIPS (2024), MLCB (2023), NeurIPS LMRL Workshop (2022), NeurIPS Meta-learning Workshop (2022), ICML Pre-training Workshop (2022), IEEE Communications Letters (2020)

Volunteering

Mentor, Graduate Application Assistance Program (GAAP), Dep. of Computer Science (UofT) 2023 - 2024
Youth Mentor, High school research involvement program, ECE, (UBC) 2019

Professional Affiliations

Engineers and Geo-scientists of British Columbia (EGBC), *Student Member*, 2016-2020
Institute of Electrical and Electronics Engineers (IEEE), *Student Member*, 2017-2020