

Mohammed Adnan

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📁 [adnan1306.github.io/](https://github.com/adnan1306)

EDUCATION

Vector Institute/University of Calgary

Ph.D. student

Toronto, Canada

Jan 2023 - present

Advisors: Dr. Yani Ioannou & Dr. Rahul G. Krishnan.

Research Interests: Weight-Space Symmetries, Training Dynamics,
Understanding loss-landscape.

University of Waterloo

MASc in Machine Learning & Vision, GPA: 4.0/4.0

Waterloo, Canada

Graduated: August 2021

Thesis: Set Representation Learning

Indian Institute of Technology Guwahati

B.Tech in Electronics & Electrical Engineering

Guwahati, India

Graduated: June 2019

Thesis: Super Resolution of Facial Images.

RESEARCH AWARDS

○ Izaak Walton Killam Fellowship

Nominated as a Killam Laureate and awarded 90,000 CAD in research funding.

○ Digital Research Alliance of Canada (DRAC) Funding

Awarded CAD 35,000 in research funding to investigate the impact of LLM compression methods on model bias and fairness.

○ Borealis AI Research Fellowship

Selected among **top-10** graduate students in CS by Borealis AI, an AI arm of the Royal Bank of Canada (RBC).

○ NSERC Doctoral Funding

Awarded CAD 120,000 in funding for the doctoral studies via a nationwide competition based on the research proposal.

○ Digital Research Alliance of Canada — Resource Allocation Competition (RAC)

Co-authored the research proposal for the RAC, which was awarded 25 Reference GPU Units (RGU) of compute, equivalent to 6.25 A100 GPU years (or 28000\$ AWS credit).

EXPERIENCE

Borealis AI

ML Research Intern

Toronto, Canada

May 2025 - Aug 2025

- Worked on learning user-aligned representation space using LLMs.
- Advisor: Dr. Kevin H. Wilson.

Roche

ML Research Intern

Toronto, Canada

July 2023 - Jan 2024

- Worked on model pruning and compression (US patent app under-review).
- Advisor: Dr. Yao Nie & Dr. Qinle Ba.

Borealis AI

ML Research Intern

Toronto, Canada

Sept 2022 - Jan 2023

- Worked on data augmentation for Temporal Point Processes.
- Advisor: Dr. Fred Tung & Dr. Gabriel Oliveira.

Vector Institute/University of Guelph

Research Associate

- Worked on domain-agnostic self-supervised learning and continual learning.
- Advisor: Dr. Graham Taylor.

Toronto, Canada

Sept 2021 - Aug 2022

University of Waterloo

Graduate Research Assistant

- Advisor: Dr. Hamid Tizhoosh.
- Published in ECCV 2020, CVPR(W) 2020, & MICCAI 2021.

Waterloo, Canada

Sept 2019 - August 2021

Waterloo AI Institute

Shastri Indo-Canadian Research Fellow

- Awarded fellowship by Govt. of India and Canada to do research at Waterloo AI Institute.

Waterloo, Canada

May 2018 – July 2018

National University of Singapore & Singapore Health

Visiting Researcher

- Implemented machine learning algorithms for analyzing high resolution cytometry images.
- Advisor: Dr. Hemant Unadkat.

Singapore

May 2017 – July 2017

PUBLICATIONS

1. Symmetry Breaking in Sparse Training to Unmask the Role of Overparameterization.
Mohammed Adnan, Tom Jacobs, Advait Gadhikar, Yani Ioannou, Rebekka Burkholz, *under review*.
2. Parsimony via Active Weight Perturbation.
Bai Cong, Thomas Möllenhoff, Mohammed Adnan, Rio Yokota, Mohammad Emtiyaz Khan, *under review*.
3. Generalizing the Geometry of Model Merging Through Fréchet Averages.
Marvin F. da Silva, Mohammed Adnan, Felix Dangel, Sageev Oore, *under review*.
4. SparseOpt: Addressing Normalization-induced Gradient Skew in Sparse Training.
Mohammed Adnan, Rohan Jain, Tom Jacobs, Ekansh Sharma, Rahul G Krishnan, Rebekka Burkholz, Yani Ioannou, **ICML 2026**.
5. Sparse Training from Random Initialization: Aligning Lottery Ticket Masks using Weight Symmetry.
Mohammed Adnan, Rohan Jain, Ekansh Sharma, Rahul Krishnan, Yani Ioannou, **ICML 2025**.
6. Structured Model Pruning for Efficient Inference in Computational Pathology.
Mohammed Adnan, Qinle Ba, Nazim Shaikh, Shivam Kalra, Satarupa Mukherjee, Auranuch Lorsakul, **MICCAI 2024 Workshop**.
7. Monitoring Shortcut Learning using Mutual Information.
Mohammed Adnan, Yani A. Ioannou, Kenyon Tsai, Angus Galloway, HR Tizhoosh, Graham Taylor, **ICML 2022 Workshop on Spurious Correlations, Invariance and Stability**
8. Federated Learning and Differential Privacy for Medical Image Analysis.
Mohammed Adnan, Shivam Kalra, Jesse C. Cresswell, Graham W. Taylor, Hamid Tizhoosh, **Nature Scientific Reports**
9. Domain-Agnostic Clustering with Self-Distillation.
Mohammed Adnan, Yani A. Ioannou, Kenyon Tsai, Graham Taylor, **NeurIPS 2021 Workshop on Self-Supervised Learning - Theory and Practice**

10. Pay Attention with Focus: A Novel Learning Scheme for Classification of Whole Slide Images.
Shivam Kalra, Mohammed Adnan, Sobhan Hemati, Taher Dehkharghanian, Shahryar Rahnamayan, Hamid Tizhoosh, **MICCAI 2021**
11. Learning Permutation Invariant Representation using Memory Network.
Shivam Kalra*, Mohammed Adnan*, Graham Taylor, Hamid Tizhoosh, **ECCV 2020**
12. Representation Learning of Histopathology Images using Graph Neural Networks.
Mohammed Adnan*, Shivam Kalra*, Graham Taylor, Hamid Tizhoosh, **CVPR(W) 2020**.

AWARDS

1. **Shastri Indo-Canadian Research Fellowship 2018 (MITACS)**
Among 5 students to be awarded Shastri Indo Canadian Research Fellowship 2018.
2. **Vector Institute Scholarship in AI 2019**
Awarded merit-based scholarship by Vector Institute, Canada.
3. **University of Waterloo Graduate Scholarship 2020, 2021**
Awarded scholarship for excellence in academics.
4. **Alberta Graduate Excellence Scholarship 2023**
Awarded scholarship for excellence during Ph.D.
5. **ICML 2026 Travel Funding**
Recognized as a top reviewer; awarded travel funding for attending ICML 2026 in Seoul, South Korea.

ADDITIONAL

- **Academic Service:** Lead organizer of **ICML 2026** Workshop on Weight-Space Symmetries, Co-organized **ICLR 2025** Workshop on Sparsity in LLMs, Co-organized Vector Institute SSL Reading Group (2023-24).
- **Reviewer:** ICLR, UAI, ICML, NeurIPS, CVPR (2023-2025), ECCV 2024, AISTATS 2025, TMLR.
- **Deep Learning Frameworks:** TensorFlow, PyTorch, JAX.

* denotes equal contributions