Mohammed Adnan

✉ mohd.adnan1306@gmail.com
🖥 adnan1306.github.io/

EDUCATION

Vector Institute/University of Calgary · **Toronto, Canada**
Ph.D. student · *Jan 2023 - present*

Advisors: Dr. Yani Ioannou & Dr. Rahul G. Krishnan.
Research Interests: sparse training, efficient ML and understanding training dynamics.

University of Waterloo · **Waterloo, Canada**
MASc in Machine Learning & Vision, GPA: 4.0/4.0 · *Graduated: August 2021*

Thesis: Set Representation Learning: A Framework for Learning.
Gigapixel Images

Indian Institute of Technology Guwahati · **Guwahati, India**
B.Tech in Electronics & Electrical Engineering · *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, which is an AI arm of the Royal Bank of Canada (RBC).
- **NSERC Doctoral Funding**
  Awarded CAD 120,000 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 · **Toronto, Canada**
ML Research Intern · *May 2025 - Present*
- Working on learning user-aligned representation space using LLMs.
- Advisor: Dr. Kevin H. Wilson.

Roche · **Toronto, Canada**
ML Research Intern · *July 2023 - Jan 2024*
- Worked on model pruning and compression (US patent app under-review).
- Advisor: Yao Nie & Qinle Ba.

Borealis AI · **Toronto, Canada**
ML Research Intern · *Sept 2022 - Jan 2023*
- Worked on data augmentation for Temporal Point Processes.
- Advisor: Fred Tung & Gabriel Oliveira.

Vector Institute/University of Guelph <div align="right">**Toronto, Canada**</div>
Research Associate <div align="right">*Sept 2021 - Aug 2022*</div>
- Worked on domain-agnostic self-supervised learning and continual learning.
- Advisor: Dr. Graham Taylor.

University of Waterloo <div align="right">**Waterloo, Canada**</div>
Graduate Research Assistant <div align="right">*Sept 2019 - August 2021*</div>
- Advisor: Dr. Hamid Tizhoosh.
- Published in ECCV 2020, CVPR(W) 2020, & MICCAI 2021.

Waterloo AI Institute <div align="right">**Waterloo, Canada**</div>
Shastri Indo-Canadian Research Fellow <div align="right">*May 2018 – July 2018*</div>
- Awarded fellowship by Govt. of India and Canada to do research at Waterloo AI Institute.

National University of Singapore & Singapore Health <div align="right">**Singapore**</div>
Visiting Researcher <div align="right">*May 2017 – July 2017*</div>
- Implemented machine learning algorithms for analyzing high resolution cytometry images.

PUBLICATIONS

1. Sparse Training from Random Initialization: Aligning Lottery Ticket Masks using Weight Symmetry.
   Mohammed Adnan, Rohan Jain, Ekansh Sharma, Rahul Krishnan, Yani Ioannou, **ICML 2025**.
2. Structured Model Pruning for Efficient Inference in Computational Pathology.
   Mohammed Adnan, Qinle Ba, Nazim Shaikh, Shivam Kalra, Satarupa Mukherjee, Auranuch Lorsakul, **MICCAI 2024 Workshop**.
3. 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**
4. Federated Learning and Differential Privacy for Medical Image Analysis.
   Mohammed Adnan, Shivam Kalra, Jesse C. Cresswell, Graham W. Taylor, Hamid Tizhoosh, **Nature Scientific Reports**
5. 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**
6. 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**
7. Learning Permutation Invariant Representation using Memory Network.
   Shivam Kalra*, *Mohammed Adnan**, Graham Taylor, Hamid Tizhoosh, **ECCV 2020**
8. Representation Learning of Histopathology Images using Graph Neural Networks.
   *Mohammed Adnan**, Shivam Kalra*, Graham Taylor, Hamid Tizhoosh, **CVPR(W) 2020**.
9. A Materiomics Approach to Pulp Regeneration.
   Pei Fang, Aliz Kunstar, Apoorva Shivankar, *Mohammed Adnan*, Hemant Unadkat, **American Association of Endodontists (AAE) Conference, 2018**.
10. A novel topographical driven bioactive membrane for guided tissue regeneration.
    Aliz Kunstar, Apoorva Shivankar, *Mohammed Adnan*, Hemant Unadkat, **SingHealth Duke-NUS Scientific Congress 2018**.

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* denotes equal contributions

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.

ADDITIONAL

- **Organizer**: Sparsity in LLMs Workshop@ICLR 2025, SSL Reading Group.
- **Reviewer**: ICLR, UAI, NeurIPS, CVPR 2023-2025, ECCV 2024, AISTATS 2025, TMLR.
- **Programming Languages**: Python, C, C++, Verilog, MATLAB.
- **Deep Learning Frameworks**: TensorFlow, PyTorch, JAX.