

Mohammed Adnan

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EDUCATION

Vector Institute/University of Calgary

Ph.D. student

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

Toronto, Canada

Jan 2023 - present

University of Waterloo

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

Thesis: Set Representation Learning: A Framework for Learning.

Gigapixel Images

Waterloo, Canada

Graduated: August 2021

Indian Institute of Technology Guwahati

B.Tech in Electronics & Electrical Engineering

Thesis: Super Resolution of Facial Images

Guwahati, India

Graduated: June 2019

Research Grants

- **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 a AI arm of 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

Roche

ML Research Intern

- Working on pruning and compression.
- Advisor: Yao Nie & Qinle Ba

Toronto, Canada

July 2023 - Jan 2024

Borealis AI

ML Research Intern

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

Toronto, Canada

Sept 2022 - Jan 2023

Vector Institute/University of Guelph

Research Associate

- Working 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

Waterloo, Canada

Sept 2019 - August 2021

- Worked on Differentially Private Federated Learning for Medical Imaging.
- Proposed a new algorithm for learning Permutation Invariant Representations.
- Proposed new framework for Multiple Instance Learning using Graph Neural Networks.
- Proposed a new hierarchical learning framework for Multiple Instance Learning.
- Published in ECCV 2020, CVPR(W) 2020, & MICCAI 2021

Waterloo AI Institute

Waterloo, Canada

Shastri Indo-Canadian Research Fellow

May 2018 – July 2018

- Awarded fellowship by Govt. of India and Canada to do research at Waterloo AI Institute.
- Worked on One-Shot Content Based Image Retrieval for histopathology images.
- Designed GUI based image retrieval system for computer aided diagnosis.

National University of Singapore & Singapore Health

Singapore

Visiting Researcher

May 2017 – July 2017

- Worked on a joint project between National University of Singapore and SingHealth to study the effect of topography on liver and dental cells using machine learning algorithms.
- Implemented machine learning algorithms for analyzing high resolution cytometry images..

PUBLICATIONS

1. Winning Tickets from Random Initialization: Aligning Masks for Sparse Training
*Rohan Jain**, *Mohammed Adnan**, *Ekansh Sharma*, *Yani Ioannou*, **NeurIPS 2024 Workshop**.
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. Differentially Private Federated Learning for Medical Image Analysis
Mohammed Adnan, *Jesse C. Cresswell*, *Shivam Kalra*, *Graham W. Taylor*, *Hamid Tizhoosh*, **AAAI 2022 Trustworthy AI for Healthcare Workshop**
6. 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**
7. 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**
8. Learning Permutation Invariant Representation using Memory Network
*Shivam Kalra**, *Mohammed Adnan**, *Graham Taylor*, *Hamid Tizhoosh*, **ECCV 2020**
9. Representation Learning of Histopathology Images using Graph Neural Networks
*Mohammed Adnan**, *Shivam Kalra**, *Graham Taylor*, *Hamid Tizhoosh*, **CVPR(W) 2020**.
10. A Materiomics Approach to Pulp Regeneration
Pei Fang, *Aliz Kunstar*, *Apoorva Shivankar*, *Mohammed Adnan*, *Hemant Unadkat*, **American Association of Endodontists (AAE) Conference, 2018**.
11. A novel topographical driven bioactive membrane for guided tissue regeneration
Aliz Kunstar, *Apoorva Shivankar*, *Mohammed Adnan*, *Hemant Unadkat*, **SingHealth Duke-NUS Scientific Congress 2018**.

* 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**
Awarded scholarship for excellence in academics
4. **University of Waterloo Graduate Scholarship 2021**
Awarded scholarship for excellence in academics
5. **Alberta Graduate Excellence Scholarship 2023**
Awarded scholarship for excellence during Ph.D.

ADDITIONAL

- **Reviewer:** ICLR 2022, UAI 2022, NeurIPS 2022, CVPR 2023, NeurIPS 2023, UAI 2023, ICLR 2023, Transactions on Medical Imaging, ICLR 2024, ICML 2024, UAI 2024, ECCV 2024, ICLR 2025, NeurIPS 2024, AISTATS 2025.
- **Programming Languages:** Python, C, C++, Verilog, MATLAB.
- **Deep Learning Frameworks:** TensorFlow, PyTorch, JAX.