Ahmad Sajedi

Ph.D. Candidate · Computer Visoin Scientist and Engineer

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Education

University of Toronto — *Toronto, CA*

Ph.D. in Engineering Science – Electrical and Computer Stream — *Sep 2020 - Current*

- **Thesis:** "Towards Effects of Data on Visual Classification Tasks"
- **Supervisors:** Prof. Konstantinos N. Plataniotis & Prof. Yuri A. Lawryshyn

University of Waterloo — *Waterloo, CA*

M.Sc. in Engineering Science – Electrical and Computer Stream — *Sep 2018 - Aug 2020*

- **Thesis:** "Coding for Data Analytics: New Information Distances"
- **Supervisor:** Prof. En-hui Yang
- Outstanding Graduates

Amirkabir University of Technology — *Tehran, IR*

B.Sc. in Engineering Science – Electrical and Computer Stream — *Sep 2014 - Aug 2018*

- **Thesis:** "Time and Frequency Synchronization for OFDM Signal with Software Defined Radio"
- **Supervisor:** Prof. Mohammad Javad Emadi
- Outstanding Graduates

Professional Experience

Royal Bank of Canada (RBC) — *Toronto, CA*

Student Researcher — *Jan 2022 - Current*

- Designed an efficient dataset distillation pipeline using a custom feature proxy loss to minimize training costs for computer vision datasets
- Successfully published at ICCV 2023, under the title "DataDAM: Efficient Dataset Distillation with Attention Matching"
- Implemented dataset distillation algorithms for large-scale tabular datasets

Centre for Management of Technology & Entrepreneurship (CMTE) — *Toronto, CA*

Graduate Research Associate — *Sept 2021 - Current*

- Introduced a novel contrastive learning framework for multi-label visual classification tasks
- Defined a new probabilistic distance metric with applications in signal processing and machine learning
- Successfully Evaluated and presented findings as technical papers and oral presentations

Multimedia Lab (Bell) — *Toronto, CA*

Graduate Research Associate — *Sept 2020 - Current*

- Investigated the effect of data on different visual downstream tasks, including multi-label classification and knowledge distillation
- Designed three different frameworks for transferring knowledge from model-to-model, data-to-data, and data-to-model
- Built frameworks and executable libraries for streamlining graduate student research
- Successfully published findings at top computer vision conferences

Multimedia Communications Lab (Leitch) — *Waterloo, CA*

Graduate Research Assistant — *Sept 2018 - Aug 2020*

- Improved time and space computational costs for training deep CNN models using sparsity and patterns in the feature maps
- Collaborated with other engineers to refine data pipelines and model infrastructure as packaged libraries

Publications & Patents

ProbMCL: Simple Probabilistic Contrastive Learning for Multi-label Visual Classification
Ahmad Sajedi, Samir Khaki, Yuri A. Lawryshyn, Konstantinos N. Plataniotis
IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP), 2024

DataDAM: Efficient Dataset Distillation with Attention Matching
Ahmad Sajedi,Samir Khaki,Ehsan Amjadian, Lucy Z. Liu, Yuri A. Lawryshyn, Konstantinos N. Plataniotis
Proceedings of the IEEE/CVF International conference on computer vision (ICCV), 2023

A New Probabilistic Distance Metric with Application in Gaussian Mixture Reduction
Ahmad Sajedi, Yuri A. Lawryshyn, Konstantinos N. Plataniotis
IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP), 2023

Subclass Knowledge Distillation with Known Subclass Labels
Ahmad Sajedi, Yuri A. Lawryshyn, Konstantinos N. Plataniotis
IEEE 14th Image, Video, and Multidimensional Signal Processing Workshop (IVMSP), 2022

Data-to-Model Distillation: Data-Efficient Learning Framework
Ahmad Sajedi, Samir Khaki, Lucy Z. Liu, Ehsan Amjadian, Yuri A. Lawryshyn, Konstantinos N. Plataniotis
CVPR 2024 Pending

KMCL: Supervised Contrastive Learning for Multilabel Visual Representation
Ahmad Sajedi, Samir Khaki, Konstantinos N. Plataniotis, Mahdi S. Hosseini
CVPR 2024 Pending

FedPnP: A Plug and Play Approach For Personalized Graph-Structured Federated Learning
Arash Rasti-Meymandi, **Ahmad Sajedi**, Konstantinos N. Plataniotis
ICLR 2024 Pending

High-Performance Convolution using Sparsity and Patterns for Inference in Deep Convolutional Neural Networks
Hossam Amer, Ahmed H. Salamah, **Ahmad Sajedi**, En-hui Yang
ACM Pending

DataDAM: Efficient Dataset Distillation with Attention Matching
Ahmad Sajedi, Ehsan Amjadian, Lucy Z. Liu, Samir Khaki, Yuri A. Lawryshyn, Konstantinos N. Plataniotis
US Patent Pending

Data-to-Model Distillation: Data-Efficient Learning Framework
Ahmad Sajedi, Ehsan Amjadian, Lucy Z. Liu, Samir Khaki, Yuri A. Lawryshyn, Konstantinos N. Plataniotis
US Patent Pending

On the Efficiency of Subclass Knowledge Distillation in Classification Tasks
Ahmad Sajedi, Konstantinos N. Plataniotis
arXiv Preprint

Invited Talks

2023	Dataset Distillation: A Data-Efficient Learning Framework	@ Royal Bank of Canada	*Toronto, CA*
2022	Dataset Distillation: A Data-Efficient Learning Framework	@ University of Toronto	*Toronto, CA*
2022	Visual Explainable AI for Convolutional Neural Networks	@ University of Toronto	*Toronto, CA*
2022	Subclass Knowledge Distillation with Known Subclass Labels	@ Royal Bank of Canada	*Toronto, CA*
2022	Knowledge Distillation for Building Lightweight Models in Classification Tasks	@ University of Toronto	*Toronto, CA*
2021	Sentiment Analysis on Twitter Texts	@ University of Toronto	*Toronto, CA*

Teaching

Project TA	Digital Image Processing and Applications, University of Toronto,	2023, 2022
Project TA	Data Science Methods and Statistical Learning, University of Toronto,	2024, 2023, 2022
Project TA	Introduction to Data Science and Analytics, University of Toronto,	2021
Project TA	Introduction to Machine Learning and Data Mining, University of Toronto,	2021
Lead TA	Statistics, University of Toronto,	2023
Assistant	Probability and Applications, University of Toronto,	2024, 2023, 2022, 20221, 2020
Assistant	Probability and Statistics, University of Toronto,	2024, 2023, 2022, 2021
Assistant	Probability, Statistics, and Data Analysis I, University of Toronto,	2023-2021
Assistant	The Practice of Statistics I, University of Toronto,	2023, 2022
Assistant	Matrix Algebra and Optimization, University of Toronto,	2021
Assistant	Convex Optimization , University of Waterloo,	2020
Assistant	Probability and Statistics, University of Waterloo,	2019
Assistant	Discrete Mathematics and Logic I & II , University of Waterloo,	2020, 2019

Academic Services

Reviewer CVPR 2024, ICASSP 2023, ICASSP 2024, ECCV 2024
Organizer First Workshop Proposal on Dataset Distillation in ECCV 2024

Skills

Programming Python (Pandas, PyTorch, TensorFlow, NumPy, Scikit-learn. etc.), R(ggplot2), C/C++, MATLAB, HTML, JavaScript.
Miscellaneous Linux, LaTeX(Overleaf/R Markdown), Tableau, Microsoft Office, Firebase, Git.
Soft Skills Time Management, Teamwork, Problem-solving, Documentation, Engaging Presentation.

Honors & Awards

2020-2024	Edward S. Rogers Graduate Fellowship	*Toronto, CA*
2020-2024	Graduate Research Fellowship	*Toronto, CA*
2018-2020	Graduate Research Scholarship (GRS)	*Waterloo, CA*
2015-2024	Iran's National Elites Foundation(INEF)'s Grant	*Tehran, IR*
2014	Top 0.1% in Iranian National University Entrance Exam ("Konkoor'')	*Tehran, IR*
2012	Finalist in National Chemistry Olympiad	*Tehran, IR*

References

Konstantinos N. Plataniotis	Professor & Director @ University of Toronto,	kostas@ece.utoronto.ca
Yuri A. Lawryshyn	Professor & Director @ University of Toronto,	yuri.lawryshyn@utoronto.ca
Lucy Z. Liu	Director of data science @ Royal Bank of Canada,	lucy.z.liu@rbc.com
Ehsan Amjadian	Director of AI & Technology @ Royal Bank of Canada,	ehsan.amjadian@rbc.com