

# Ahmad Sajedi

PH.D. CANDIDATE · COMPUTER VISION SCIENTIST AND ENGINEER

University of Toronto, Canada

✉ sajedi.ah@gmail.com | 🏠 ahmadsajedi.github.io | 🌐 github.com/AhmadSajedi

## Education

### University of Toronto

Toronto, CA

PH.D. IN ENGINEERING SCIENCE – ELECTRICAL AND COMPUTER STREAM

Sep 2020 - Aug 2024

- **Thesis:** “Effects of Data on Visual Classification Tasks”
- **Supervisors:** Prof. Konstantinos N. Plataniotis & Prof. Yuri A. Lawryshyn
- Outstanding Candidates

### 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 with Honor

### 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 with Honor

## 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 two papers at ICCV 2023 and CVPR-DD 2024
- 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 the image classification tasks, particularly on *Efficient Learning* and *Multi-label Representation Learning*
- Designed three different frameworks for distilling the 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 & Preprints

MACHINE LEARNING AND COMPUTER VISION (1 ICCV, 1 CVPR-DD, 4 ECCV, 2 ICASSP, 1 ACM, 1 IVMSP)

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*

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*

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*

### ATOM: Attention Mixer for Efficient Dataset Distillation

**Ahmad Sajedi**, Samir Khaki, Kai Wang, Lucy Z. Liu, Yuri A. Lawryshyn, Konstantinos N. Plataniotis

*Proceedings of the IEEE/CVF Computer Vision and Pattern Recognition (CVPR-DD), 2024*

### Sometimes Less is More: Multi-label Dataset Distillation

**Ahmad Sajedi**, Samir Khaki, Yuri A. Lawryshyn, Konstantinos N. Plataniotis

*ECCV 2024 Pending*

### Data-to-Model Distillation: Data-Efficient Learning Framework

**Ahmad Sajedi**, Samir Khaki, Lucy Z. Liu, Ehsan Amjadian, Yuri A. Lawryshyn, Konstantinos N. Plataniotis

*ECCV 2024 Pending*

### Supervised Contrastive Learning for Multi-label Visual Representation

**Ahmad Sajedi**, Samir Khaki, Konstantinos N. Plataniotis, Mahdi S. Hosseini

*ECCV 2024 Pending*

### 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*

### FedPnP: Personalized Graph-Structured Federated Learning

Arash Rasti-Meymandi, **Ahmad Sajedi**, Konstantinos N. Plataniotis

*ECCV 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*

### On the Efficiency of Subclass Knowledge Distillation in Classification Tasks

**Ahmad Sajedi**, Konstantinos N. Plataniotis

*arXiv Preprint*

## Patents

---

### Efficient Dataset Distillation with Attention Matching

**Ahmad Sajedi**, Ehsan Amjadian, Samir Khaki, Lucy Z. Liu, Yuri A. Lawryshyn, Konstantinos N. Plataniotis

*US Patent Pending*

### Data-to-Model Distillation

**Ahmad Sajedi**, Ehsan Amjadian, Samir Khaki, Lucy Z. Liu, Yuri A. Lawryshyn, Konstantinos N. Plataniotis

*US Patent Pending*

## Invited Talks

---

2024	Effect of Data on Classification Tasks	@ Royal Bank of Canada	Toronto, CA
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

---

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

## Academic Services

---

**Reviewer** CVPR 2024, ICASSP 2023, ICASSP 2024, ECCV 2024  
**Primary Chair** First Dataset Distillation Challenge 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 ("Konkour")	Tehran, IR
2012	Finalist in National Chemistry Olympiad	Tehran, IR

## References

---

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