Mehrab Hamidi

M.s. Student at McGill University

Research Assistant at Mila

ℹ 7 October 1999

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About me ——————

Experienced data scientist with strong mathematics background and researcher with a demonstrated history of working in the computer software industry. Skilled in Data Science, Python, Java, R, Algorithms, and Research. Strong engineering professional with a Bachelor's degree focused in Computer Science from Sharif University of Technology.

Interests ——————

Deep Learning Theory
Geometrical Analysis of Deep Relu Networks
Optimization
Statistical Inference
Computational Biology

Education

since 2022	M.s. in Computer Science Computer Science Department	McGill University/Mila
2017-2022	B.Sc. in Computer Science Mathematics and Computer Science Department	Sharif University of Technology
2018-2022	Minor in Mathematics Mathematics and Computer Science Department	Sharif University of Technology

Publications

2023	Predicting Survival of Iranian COVID-19 Patients Infected by Various Variants Including Omicron from Ct Scan Images and Clinical Data Using Deep Neural Networks(Helyion)
2023	A New R Package for Categorizing Coding and Non-Coding Genes (pre-print)
2022	Somatic point mutations are enriched in non-coding RNAs with possible regulatory function in breast cancer (Nature Communication Biology)
2020	Accurate and Rapid Diagnosis of COVID-19 Pneumonia with Batch Effect Removal of Chest CT-Scans and Interpretable Artificial Intelligence (pre-print)

Research Experience

Since 2023	Hidden Symmetries of Deep ReLU Networks This ongoing research explores the function spaces of deep ReLU networks, focusing on uncovering architectural symmetries. The project is a collaborative effort with Dr. Elisenda Grigsby and Dr. Kathryn Lindsey from the Mathematics Department at Boston College.
2022-2023	Reverse-Engineering Deep ReLU Networks This project involved the development of techniques to deduce the weights, biases, and architecture of deep ReLU networks solely from input-output queries, without prior assumptions about their structure.
2020	Likelihood-Free Method for Estimating Trait Phenotype Posterior Distributions We aimed to identify causal SNPs and predict phenotypes for specific traits using likelihood-free Bayesian methods. The research also extended to applications in Longitudinal Genome-wide Association Studies.
2019	Landscape Analysis of Non-Coding RNA in Cancer This pioneering study introduced an integrative pipeline to analyze the mutational load across non-coding RNA genes in six cancer types, identifying significant cancer-specific mutations. I have authored two of the four papers from this project, with the remaining papers under review or in preparation for publication.
2019	Enhancing Variable Selection for Categorical Data Using the Knockoff Method This study focuses on improving the performance and applicability of variable selection methods for categorical data, specifically through the enhancement of the Knockoff method.

Relevant Courses

- Graduates Courses

  - Theory of Deep Learning (2023) - Université de Montréal
    Ioannis Mitliagkas

  - Mathematical Tools in Computer Science (2022) - McGill University
    Prof. David Rolnick

  - Bayesian Method in Statistics and Learning (2019) - SUT
    Efron, B., Hastie, T. (2016). Computer age statistical inference (Vol. 5)

  - Machine Learning (2018) - SUT
    Bishop, C. M. (2006). Pattern recognition. Machine learning, 128(9).

  - Convex optimization (Audit)
    Boyd, S., Boyd, S. P., Vandenberghe, L. (2004). Convex optimization. Cambridge university press.

  - Deep Learning (Audit)

  - Advanced Bioinformatics (Audit)

- Undergraduates Courses

  - Statistics
    Wonnacott, T. H., Wonnacott, R. J. (1969). Introductory statistics.

  - Linear Algebra

  - Game Theory
    Ross, S. M. (1976). A first course in probability (No. 519.2 R6). New York.

  - Mathematical Real Analysis

  - Information Theory

  - Operation Research

  - Artificial Intelligence

  - Stochastic Process
    Lawler, G. F. (2018). Introduction to stochastic processes. Chapman and Hall/CRC.

Work Experience

since 2021	Research Assisstant Intern	McGill University
	Currently working on a project about bayesian inference using likelihood free variational methods	
2018-2021	Undergraduate Research Assistant	DML
	Involved in several research projects in genomics such as landscape analysis of non-coding RNAs	
2020-2021	Data Scientist	AI-Med
	Provided comprehensive analysis and recommend solutions to address complex medical-related problems and issues using data (mostly image type data) from internal and external sources and applied advanced analytical methods such as DL to assess factors impacting growth and profitability across product and service offerings.	
2019-2020	Machine Learning Engineer	Fanap
	Implemented and evaluated artificial intelligence and machine learning algorithms and neural networks for diverse industries. I worked as a member of team on a project about Automatic Speech Recognition	

Honors and Awards

2017	Ranked 130 among one hundred thousand student attendance in university entrance exam (Konkur)
2016	Best poet of the state
2015	Gold medal of national swimming competition and a member of the university swimming team
2017	A member of the Iranian Mathematical Society.

Skills

Languages	Farsi/Persian (native)
	English (fluent) TOEFL iBT - November 27, 2021 (Overall: 100) Reading: 27 - Listening: 28 - Speaking: 23 - Writing: 22
Software	Python, R, Java, LaTeX, C++
Tools	Pytorch, Tensorflow, Scipy, CVX, ggplot, limma
Mathematics	Linear Algebra, Variational Inference, Bayesian Statistics, Convex and Linear Optimization, Probability, Stochastic Processes, Combinatorics, Graph Theory, Real Analysis

Other Experiences

- Teacher Assisstant

  - Foundations of Programming (COMP202)
    McGill University - Fall 2022

  - Statistical Machine Learning (graduate course) (2020)

  - Artificial Intelligence (2020)

  - Discrete Mathematics (2019)

  - Fundamentals of Programming (2018)

- Teaching Combinatory
  National Olympiad in Informatics - since 2018

Hobbies

- Playing Tennis
- Working out
- Hiking
- Mountain Climbing
- Watching Movies
- Reading books
- Playing Violin/Kamancheh

Refrences

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