HAMID KAMKARI

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https://hamidrezakmk.github.io/

EDUCATION

University of Toronto   *2022 - 2024*
Master of Science in Applied Computing (MScAC)
Department of Computer Science
Ongoing Courses: *(CSC2541)* Topics in Machine Learning: Introduction to Causality, *(MAT1510)* Deep Learning: Theory and Data Science, *(CSC2240)* Graphs, Matrices, and Continuous Optimization, *(CSC2701)* Communication for Computer Scientists

Sharif University of Technology   *2018 - 2022*
Bachelor of Science   Overall GPA 19.22/20
Department of Computer Engineering   Ranked Among the Top 10
Courses: *(CE695)* Stochastic Processes, *(CE417)* Artificial Intelligence, *(CE494)* Introduction to Computational Biology, *(CE282)* Linear Algebra, *(CE181)* Fundamentals of Probability and Statistics, *(CE354)* Algorithm Design, *(CE415)* Theory of Formal Languages and Automata, *(MAT034)* Differential Equations

RESEARCH AND PUBLICATION

Sharif University of Technology   **Tehran, Iran**
Predicting Drug Combination Effects by Utilizing Chemical & Multi-Omics Data   *January 2022 - Ongoing*
· (Preparing manuscript for submission)
· Used Graph Neural Networks and Attention mechanisms to create a general state-of-the-art framework, named DeepDDR, for predicting drug dose response using SMILES representation of drugs.

Maxplanck Institute of Informatics (MPI-INF)   **Saarbrücken, Germany**
Convex Optimization - Algorithmic Perspective of Training Neural Networks   *August 2020 - February 2022*
· Using foundations in linear algebra, curated ideas that led to a creative dynamic system for a set of convex optimization problems. This led to a paper under review (STACS) on novel algorithms for tackling Semi-Definite programs using nature-inspired dynamics.
· Undertook a second internship on the fundamentals of fine-grained bounds for fine-tuning simple overparameterized perceptrons. Using reduction from core algorithmic problems, proved fine-tuning problem on perceptrons is exponential w.r.t the dimension of the hidden units.

Aalto University   **Espoo, Finland**
RNA sequence design using Graph Neural Networks   *July 2021 - September 2021*
· Created a data-driven method to find RNA sequences that can fold into a certain secondary structure.
· Modeled the problem as a Markov decision process and used Monte-Carlo Tree Search to speed up the search.
· Helped improve the rollout phase using GNNs. Inspired by notions of connectivity in graph theory, obtained a suitable GNN with smart skip connections that autoregressively assigns molecules to nodes and obtains state-of-the-art results on a class of RNA structures.

WORK EXPERIENCE

Fanap IT Company   *January 2022 - August 2022*
· Research and development on deep learning methods to help restore poorly taken photos of dental panoramic images that prevents reshooting and additional x-ray exposure, and additionally, help with the tooth disease detection pipeline of dentists.

- Implemented a novel U-Net for dynamic range unification using Pytorch that can help panoramic image restoration.
- Detectron2 Mask-RCNN for instance segmentation of teeth and treatments that can help computer-aided disease detection. Created Demo using Docker and FastAPI for proof of concept and sold MVP to a client with three active radiology clinics in Tehran; all in approximately three months.

National Olympiad in Informatics Committee *September 2020 - December 2021*

- Curated and organized nation-wide competitive contests for talented students all across Iran.
- Helped with the technical infrastructure of the online code judging system using CMS online judge.

TEACHING

Academic Teaching Assistance   **University of Toronto - Sharif University of technology**

· Introduction to the theory of Computation (CSC236) François Pitt	*September 2022 - Ongoing*
· Artificial Intelligence course (CE40417) Mohammad Hossein Rohban	*September 2021 - January 2022*
· **Head** of Data Structure and Algorithms course (CE40254) - Mohammad Ghodsi	*January 2021 - June 2021*
· Artificial Intelligence course (CE40417) Mohammad Hossein Rohban	*January 2021 - June 2021*
· Probability and Statistics course (CE40181) Ali Sharifi-Zarchi	*September 2020 - January 2021*
· Discrete Structures course (CE40115) Mohammad Ali Abam	*January 2020 - June 2020*
· Advanced Algorithm design course (CE40354) Ali Sharifi-Zarchi	*January 2020 - June 2020*
· Data structure and Algorithms course (CE40254) Mahdi Safarnejad-Boroujeni	*January 2020 - June 2020*
· Data structure and Algorithms course (CE40254) Mahdi Safarnejad-Boroujeni	*September 2019 - January 2020*

Mentor-ship

- Taught creative algorithm design as well as basics of data science to employees of computer science-related companies in MAPSA boot camp.   *June 2020 / August 2020*

- Worked as Computer Olympiad Teacher in well-known Iranian high schools as well as a mentor at International Olympiad in Informatics (IOI) preparation camp for International Olympiad in Informatics held in Baku, Azarbaijan.   *January 2019 / February 2019*

HONORS AND AWARDS

🔗 **ACM-ICPC**	🔗 **APIO**	🔗 **INFO-Cup**	🔗 **Computer Olympiad**
Regional gold medal team ranked 3rd	Asia-Pacific Informatics bronze medal	World-wide contests gold medal	Ranked 5th in national contests
December 2018	*May 2018*	*March 2018*	*September of 2016 & 2017*

SKILLS

Programming Skills:	**Languages:**
Python, Pytorch, Sklearn, Docker, C++ (for competetive programming), Java, MATLAB, LaTeX.	Persian (Native) - English (Fluent) TOEFL iBT 116/120 Speaking: 28/30 - Writing: 29/30 - Reading: 30/30 - Listening: 29/30

TECHNICAL PROJECTS

🎧 **ML-Mnemonist**	🎧 **Client AI-challenge**	🎧 **Simple C Server**	🎧 **Compiler Design**
Lightweight Python framework for ML development	Python Client for a game in Sharif AI challenge	Server programmed in C with multiprocess and multithread capabilities	Compiler for object-oriented programming language
Python	*Python*	*C/C++*	*C++*