HAMID KAMKARI

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EDUCATION

University of Toronto *2022 - 2024*
Master of Science in Applied Computing (MScAC)
Department of Computer Science

Sharif University of Technology *2018 - 2022*
Bachelor of Science Overall GPA 19.22/20
Department of Computer Engineering Ranked Among the Top 10

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
Regional Gold Medal
Team ranked 3rd
December 2018

APIO
Asia-Pacific Informatics
Bronze Medal
May 2018

INFO-Cup
World-wide contests
Gold Medal
March 2018

Olympiad in Informatics
Gold and Silver Medal
In National Contests
September of 2016 & 2017

RELEVANT COURSES

Core Courses — **Sharif University of Technology**

Statistics and Probabilities (20/20), Technical Presentation (20/20), Artificial Intelligence (20/20), Algorithm Design (20/20), Algorithms and Data-Structures (20/20), Bio-Informatics (20/20), Modern Information Retrieval (20/20), Stochastic Processes (Graduate Course - 19.8/20), Linear Algebra (20/20), Numerical Computation (20/20), Signals & Systems (20/20), Operating Systems (20/20), Computer Networks (18.8/20)

Online Courses

Introduction to Machine learning, Coursera online course by Andrew Ng, HSE Advanced Machine Learning Coursera

SKILLS

Programming Skills:

Python, Pytorch, Sklearn, Docker, C++ (for competetive programming), Java, MATLAB, LaTeX.

Languages:

Persian (Native) - English (Fluent) TOEFL iBT 116/120
Speaking: 28/30 - Writing: 29/30 - Reading: 30/30 - Listening: 29/30

TECHNICAL PROJECTS

ML-Mnemonist
Lightweight Python framework for ML development
Python

Client AI-challenge
Python Client for a game in Sharif AI challenge
Python

Simple C Server
Server programmed in C with multiprocess and multithread capabilities
C/C++

Compiler Design
Compiler for object-oriented programming language
C++