

# Amir Mohammad Karimi-Mamaghan

Ph.D. student

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EECS, KTH Royal Institute of Technology, Stockholm, Sweden

Born on 1997-08-07 in Iran



## EDUCATION

Present August 2022	<b>Ph.D. in Computer Science, KTH Royal Institute of Technology, Sweden</b> <ul style="list-style-type: none"><li>&gt; Division of Decision and Control Systems</li><li>&gt; Supervisors: Karl Henrik Johansson, Stefan Bauer</li></ul>
May 2022 September 2019	<b>M.Sc. in Computer Engineering (Artificial Intelligence and Robotics), University of Tehran, Iran</b> <ul style="list-style-type: none"><li>&gt; Thesis: <i>Longevity Analysis of Cryptocurrency Addresses</i> I work on longevity (lifespan) of the addresses in popular cryptocurrencies (BTC, ETH, etc.) and try to fit a known distribution to this feature. I also try to find correlations between this feature and some other properties of the addresses.</li><li>&gt; Laboratory: Data Analytics Lab, School of Electrical and Computer Engineering</li><li>&gt; Advisor: Behnam Bahrak</li><li>&gt; GPA: 18.17/20 (4/4)</li></ul>
July 2019 September 2015	<b>B.Sc. in Software Engineering, University of Tehran, Iran</b> <ul style="list-style-type: none"><li>&gt; Thesis: <i>Classification of Electrocardiogram Signals using Machine Learning &amp; Neural Networks</i></li><li>&gt; Advisor: Siamak Mohammadi</li><li>&gt; GPA: 18.5/20 (3.96/4)</li></ul>

## PUBLICATIONS

- > Seyfi, M. A., Aghabayk, K., **Karimi Mamaghan, A.**, & Shiwakoti, N. (2023). Modeling the Motorcycle Crash Severity on Nonintersection Urban Roadways in the Australian State of Victoria Using a Random Parameters Logit Model. *Journal of Advanced Transportation*, 2023.
- > **Karimi Mamaghan, A.**, Setayesh, A., & Bahrak, B. (2022, November). Analysis of Address Lifespans in Bitcoin and Ethereum. In *2022 12th International Conference on Computer and Knowledge Engineering (ICCKE)* (pp. 288-293). IEEE.
- > Karimi-Mamaghan, M., Mohammadi, M., Meyer, P., **Karimi Mamaghan, A.**, & Talbi, E. G. (2022). Machine learning at the service of meta-heuristics for solving combinatorial optimization problems: A state-of-the-art. *European Journal of Operational Research*, 296(2), 393-422.
- > Karimi-Mamaghan, M., Mohammadi, M., Pirayesh, A., **Karimi Mamaghan, A.**, & Irani, H. (2020). Hub-and-spoke network design under congestion: A learning based metaheuristic. *Transportation research part e: logistics and transportation review*, 142, 102069.

## ACADEMIC EXPERIENCE

### Research Assistant:

- > Research Assistant at Data Analytics Lab, University of Tehran, Iran, Feb 2020- May 2022.  
I did some projects to make Bitcoin transactions in P2PKH and P2SH modes and broadcast them to the blockchain. I also did some projects to make a simple application using Solidity, web3.js and Truffle framework in order to deeply understand smart contracts. Furthermore, I worked on bitcoin transaction data and analyzed some properties of the transaction graph and bitcoin addresses and tried to find correlations between them.

### Research projects:

- > Developing a mathematical model for the hub-and-spoke network under congestion, implementation of a meta-heuristic algorithm combined with a clustering technique for solving the problem, 2020.

- › Design and implementation of a meta-heuristic combined with a reinforcement learning algorithm for solving a bi-objective stochastic resilient obnoxious  $p$ -median problem, 2021.
- › Implementation of a Reinforcement Learning Algorithm for Mountain Car Problem, 2020.  
I implemented a Fuzzy model and a RBF model for a car stuck between mountains to help the car climb the mountains using Python and Gym.
- › Design and Implementation of a Generative Adversarial Network (GAN) for Super Resolution Task, 2019.  
I implemented a GAN to increase the size of the images without diminishing the quality using PyTorch and Tensorflow.
- › Implementation of a Hidden Markov Model - Gaussian Mixture Model (HMM-GMM) acoustic model for Automatic Speech Recognition Task, 2018.  
I implemented a HMM-GMM model to classify arabic digits audio dataset using PyTorch.
- › Design and Implementation of a custom CNN/RNN network for Question Answering Task, 2018.  
I developed a custom CNN/RNN network to automatically answer questions about an image using PyTorch.
- › Analysis of Spotify songs popularity using Machine Learning Algorithms, 2020.  
I analyzed Spotify songs data (1920-2020) retrieved from Spotify API and used machine learning algorithms to predict popularity of the songs using Scikitlearn.

#### Teaching Assistant:

- › **Deep Learning:** University of Tehran, Fall 2020
- › **Database Design:** University of Tehran, Fall 2018
- › **Discrete Mathematics:** University of Tehran, Fall 2018
- › **Programming Languages and Compilers:** University of Tehran, Fall 2018
- › **Algorithm Design:** University of Tehran, Fall 2017 & Fall 2018
- › **Data Structures:** University of Tehran, Fall 2017 & Spring 2018
- › **Engineering Probability and Statistics:** University of Tehran, Fall 2017
- › **Web Development:** Allameh Helli High School (Exceptional Talents), August 2017-July 2020
- › **C++ Programming:** Allameh Helli High School (Exceptional Talents), August 2018-July 2019

## PROFESSIONAL EXPERIENCE

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### Data Engineer, Tapsell, November 2019-March 2020

- › Tapsell is the leading company in the online advertising industry in Iran. During my experience at Tapsell, I implemented a Machine Learning model to map IP address of users to the location of each one. I also worked on Sauron, a module used for fraud detection and developed some heuristics to detect fraudulent users. I worked with Spring Boot, Kotlin, and Python and I got to work with big data processing tools such as Kafka streams, ElasticSearch, MongoDB and I got familiar with Apache Spark.

### Software Engineer Intern, Rahnema College, July 2017-August 2017

- › “Unagi”, a location based social network application.  
In this project, I have focused on back-end development using Node.JS Express framework.

## HONORS AND AWARDS

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- › **Gold Open Access award** for an *invited review* paper in the European Journal of Operational Research sponsored by EURO, 2021
- › Ranked among the **top 5%** among **M.Sc.** students in Computer Engineering, University of Tehran, 2019-2021
- › Awarded **full scholarship** for M.Sc. program in Computer Engineering at the University of Tehran, September 2019-May 2022
- › Received **Straight Admission** without examination to M.Sc. in Computer Engineering Program at University of Tehran, September 2019
- › Member of Iran's National Elites Foundation, 2015-Present
- › **Awarded the FOE** (Faculty of Engineering) prize for three consecutive academic years, ranked **1st** among all **B.Sc.**

students in Software Engineering, University of Tehran, 2015-2018

- > Awarded **full scholarship** for B.Sc. program in Software Engineering at the University of Tehran, September 2015-May 2019
- > Ranked 91 among 200'000 participants (**top 0.04%**) in the nationwide university entrance exam for undergraduate studies, (B.Sc. program), 2015

## COMPUTER SKILLS

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Programming	Python, R, C, C++, C#, Kotlin, Java, Matlab
Optimization	Gurobi, Pulp, GAMS
Libraries and Frameworks	PyTorch, Tensorflow, Scikitlearn, Gym, Django, SpringBoot
Database	MySQL, NoSQLs (MongoDB, Cassandra, Redis), ElasticSearch
Tools	git, LaTeX, Docker, Kubernetes, KafkaStreams, Apache Spark