




# Soroush Omidvartehrani

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## Education

2022– **Ph.D. in Computer Science**, *Department of Computing Science*, University of Alberta, Canada (Ongoing)

- Total GPA: 4/4

2017–2021 **M.Sc. in Computer Engineering (Network branch)**, *Department of Computer Engineering*, Ferdowsi University of Mashhad, Iran

- Total GPA: 17.53/20 (3.77/4) → Ranked 3<sup>rd</sup>
- Last year GPA: 18.53/20 (4/4)

2013–2017 **B.Sc. in Computer Engineering**, *Department of Computer Engineering*, Ferdowsi University of Mashhad, Iran

- Total GPA: 16.56/20 (3.29/4) → Ranked 2<sup>nd</sup>
- Last 2 years GPA: 17.73/20 (3.69/4)

## Research Interests

Database — IoT-based Data Mining — Streaming Data

## Publications

- 2022 **Online Electricity Theft Detection Framework For Large-Scale Smart Grid Data**, *Soroush Omidvar Tehrani*, Afshin Shahrestani, Mohammad Hossein Yaghmaee Moghaddam, Electric Power Systems Research
- 2021 **Filter Based Time-Series Anomaly Detection in AMI using AI Approaches**, Alireza Rahimi, Afshin Shahrestani, Sina Ramezani, Pedram Zamani, *Soroush Omidvar Tehrani*, Mohammad Hossein Yaghmaee Moghaddam, 5<sup>th</sup> International Conference on Internet of Things and Applications (IoT 2021), held in Isfahan, Iran
- 2021 **Anomaly in Power Consumption** (in Persian), *Soroush Omidvar Tehrani*, Mohammad Hossein Yaghmaee Moghaddam, ISBN: 978-622-7605-38-9, Tolooe Majd, Iran
- 2020 **Decision Tree based Electricity Theft Detection in Smart Grid**, *Soroush Omidvar Tehrani*, Mohammad Hossein Yaghmaee Moghaddam, Mohsen Asadi, 4<sup>th</sup> International Conference on Internet of Things and Applications, held in Mashhad, Iran
- 2019 **Extracting Effective Features for Descriptive Analysis of Household Energy Consumption using Smart Home Data**, Hadise Moradi, *Soroush Omidvar Tehrani*, Behshid Behkamal, Haleh Amintoosi, High Performance Computing and Big Data Analytics Congress, held in Tehran, Iran
- 2019 **Analysis of electricity consumption in smart homes using time hierarchy** (in Persian), *Soroush Omidvar Tehrani*, Hadise Moradi, Behshid Behkamal, Haleh Amintoosi, 3<sup>rd</sup> International Conference on Internet of Things and Applications, held in Isfahan, Iran
- 2018 **FUMBOT: Design, Implementation and Detection**, *Soroush Omidvar Tehrani*, Haleh Amintoosi, 9<sup>th</sup> OIC-CERT Annual Conference & 4<sup>th</sup> Conference on Cyberspace Security Incidents and Vulnerabilities, held in Shiraz, Iran

## Honors

- 2022 Winner of Doctoral Recruitment Scholarship (\$5000 CAD) at University of Alberta
- 2021 Winner of the **Best M.Sc. IoT-related Thesis Award** among all Iranian competitors in 5<sup>th</sup> International Conference on Internet of Things and Applications
- 2021 Ranked 3<sup>rd</sup> in the first event of Novel Ideas for Facing the Increase in Power Consumption and the Challenge of Power Outage held by Iran's National Elites Foundation
- 2020 Ranked 3<sup>rd</sup> among M.Sc. Computer Engineering students at Ferdowsi University of Mashhad
- 2019 Winner of the **Best Paper Award** in the High Performance Computing and Big Data Analytics (TopHPC) congress
- 2017 Ranked 2<sup>nd</sup> among B.Sc. Computer Engineering students and got accepted for M.Sc. at Ferdowsi University without entrance qualification exam

## Languages

English: **IELTS overall band score: 7** → L(8), R(6.5), W(6), S(6.5)

Persian: Native language

## Programming and Computer Skills

Python Professional, 2018 - Present  
Spark Professional, 2019 - Present  
Java Professional, 2013 - Present  
Matlab Intermediate, 2017 - Present

Android Intermediate, 2015 - 2019  
Antlr Intermediate, 2014 - 2019  
C++ Basic, 2014

+ Familiar with:  $\text{\LaTeX}$ , Git, Docker, Linux commandline (based on LPIC1), Linux Shell Programming, Go, VHDL, Markup Languages, ARM ST Microcontrollers

## Master Thesis

Title *Data Stream-Based Anomaly Detection for Smart Meters in Smart Grid*

Supervisor Dr. Mohammad Hossein Yaghmaee Moghaddam

Advisor Dr. Mohsen Asadi

Description One aspect of using IoT devices like smart meters is detecting anomalies in advanced metering infrastructure. This work presents an anomaly detection framework for handling real-time large-scale smart grid data (based on the Spark data processing engine) to address new emerging threats like illegal cryptocurrency mining and electricity theft. It uses a hybrid approach, combining the information inferred by analyzing the reported data from distribution transformer meters with machine learning algorithms (decision tree, random forest, and gradient boosting methods) to discover fraudulent activity. The framework also allows for a trade-off between the detection rate and triggered false alarms in the decision-making process.

## Selected Teaching Experiences

- 2022–2023 **File and Database Management**, *Teacher Assistant*, Department of Computing Science, University of Alberta  
Supervised by: Dr. Davood Rafiei
- 2015–2020 **The Theory of Formal Languages and Automata**, *Teacher Assistant and Project Supervisor*, Department of Computer Engineering, Ferdowsi University of Mashhad  
Supervised by Dr. Abdorreza Savadi (2015–2020), Dr. Saeid Abrishami (2018,2019)
- 2019–2020 **Computer Networking**, *Teacher Assistant and Project Supervisor*, Department of Computer Engineering, Ferdowsi University of Mashhad  
Supervised by: Eng. Farnad Ahangari
- 2017 **Artificial Intelligence**, *Teacher Assistant and Project Supervisor*, Department of Computer Engineering, Ferdowsi University of Mashhad  
Supervised by: Dr. Ahad Harati
- 2016 **Fundamentals of Compiler Design**, *Teacher Assistant and Project Supervisor*, Department of Computer Engineering, Ferdowsi University of Mashhad  
Supervised by: Dr. Haleh Amintoosi
- 2015 **Digital System Design**, *Project Supervisor*, Department of Computer Engineering, Ferdowsi University of Mashhad  
Supervised by: Dr. Mariam Zomorodi Moghadam
- 2014 **Discrete Mathematics**, *Teacher Assistant*, Department of Computer Engineering, Ferdowsi University of Mashhad  
Supervised by: Dr. Mostafa Nouri Baygi

## Related Courses

- Modern Database Searches (UofA): A+
- Introduction to KDD & DM (UofA): A+
- Principles of Database Design (FUM): 19.1/20
- Data Mining (FUM): 19.5/20
- Artificial Intelligence (FUM): 19.1/20
- Distributed Systems (FUM): 18.3/20

+ Online Courses: Machine Learning (Coursera), Neural Networks and Deep Learning (Coursera), Applied Plotting, Charting & Data Representation in Python (Coursera), Build Basic GANs (Coursera)

## Selected Projects

- 2019–2021 **Cryptocurrency mining and electricity theft detection**, Employer: Khorasan province electrical distribution company, Dr. Mohammad Hossein Yaghmaee Moghaddam, written with Spark, Python, php
- 2017–2019 **Design and implementation of power usage smart metering system and consumption management methods based on received data**, As M.Sc. Project infrastructure, Dr. Mohammad Hossein Yaghmaee Moghaddam and IoT team of IPPBX Lab, written with Java, C, php

- 2019 **Implementation of finding relations between electricity consumption of various devices and patterns of their usage**, Course: Data Mining , Dr. Behshid Behkamal, Dr. Haleh Amintoosi and Eng. Hadise Moradi, written with Matlab
- 2019 **Performing feature selection using analysis the pattern of household energy consumption using RECS2015 dataset**, Course: Data Mining , Dr. Behshid Behkamal, Dr. Haleh Amintoosi and Eng. Hadise Moradi, written with R
- 2017 **Design and implementation of laboratory botnet (FUMBOT) which a centralized botnet, able to perform DDoS attack and utilize the bots for extracting cryptocurrency**, B.Sc. Project, Dr. Haleh Amintoosi, written with Java
- 2016 **Implementation of uninformed search algorithms (BDS, UCS, IDS, DFD, BFS) on Pac-Man game**, Course: Artificial Intelligence, Dr. Ahad Harati, written with Java
- 2016 **Developing an Android program that searches between various news sites and sends related news based on your interest**, Course: Android Programming, Dr. Samad Paydar, written with Java
- 2015–2018 **Implementing language recognition programs based on ANTLR**, Course: The Theory of Formal Languages and Automata, Dr. Abdorreza Savadi, written with Antlr

## Memberships

- 2022– DB Lab, Department of Computing Science, University of Alberta (Ongoing)
- 2019–2022 IPPBX Lab, Department of Computer Engineering, Ferdowsi University of Mashhad
- 2016–2019 CCL Lab, Department of Computer Engineering, Ferdowsi University of Mashhad

## References

**Dr. Davood Rafiei**

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**Dr. Saeid Abrishami**

Email: s-abrishami@um.ac.ir

**Dr. Mohammad Hossein Yaghmaee Moghaddam**

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**Dr. Abdorreza Savadi**

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