Soroush Omidvar Tehrani

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Education

2022–2026 **Ph.D. in Computer Science**, *Department of Computing Science*, University of Alberta, Canada (Ongoing)

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 3rd
- 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 2nd
- 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, 5th 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, 4th 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, 3rd International Conference on Internet of Things and Applications, held in Isfahan, Iran

2018 **FUMBOT: Design, Implementation and Detection**, *Soroush Omidvar Tehrani*, Haleh Amintoosi, 9th OIC-CERT Annual Conference & 4th Conference on Cyberspace Security Incidents and Vulnerabilities, held in Shiraz, Iran

Languages

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

Persian: Mother tongue

Honors

2021 Winner of the **best M.Sc. IoT-related thesis award** among all Iranian competitors in 5th International Conference on Internet of Things and Applications

2021 Ranked 3rd 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 3rd 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 2nd among B.Sc. Computer Engineering students and got accepted for M.Sc. at Ferdowsi University without entrance qualification exam

Programming and Computer Skills

Python	Professional, 2018 - Present	Android	Intermediate, 2015 - 2019
Spark	Professional, 2019 - Present	Antlr	Intermediate, 2014 - 2019
Java	Professional, 2013 - Present	C++	Basic, 2014
Matlab	Intermediate, 2017 - Present		

+ Familiar with: 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 by using a sliding window in the decision-making process.

Selected Teaching Experiences

2022 **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

- Principles of Database Design: 19.1/20
- Data Mining: 19.5/20
- Artificial Intelligence: 19.1/20
- Basics of Wireless Networking: 19/20
- Distributed Systems: 18.3/20
- Secure Computer Systems: 20/20

+ 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 electerical 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 a 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 several 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
Email: drafiei@cs.ualberta.ca

Dr. Saeid Abrishami
Email: s-abrishami@um.ac.ir

Dr. Mohammad Hossein Yaghmaee Moghaddam
Emails: yaghmaee@ieee.org | hyaghmae@ferdowsi.um.ac.ir

Dr. Abdorreza Savadi
Email: savadi@um.ac.ir