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Department of Computing Science,
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Alberta

Hadi Rohani

Computer Science Researcher

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Career Objective

- Three years of experience working with python programming and algorithm development
- Proficient in data visualization with **Tableau**, **Seaborn**, **plotly**, and **matplotlib** from Python
- Familiar with web development languages such as **TypeScript** and working with **Node.js** and **Angular**
- Highly skilled in developing machine learning tools and conducting comprehensive report as a data scientist
- Team-player with strong communication and leadership skills
- With more than 3 years of working for Canadian and European companies
- Bringing a positive reputation and work ethics from my previous research and work employers
- I have a Canadian Permanent Residency status and so I am eligible to work full-time in Canada

Skills

Tools and Languages	C/C++, Python, Git, Linux, database and MySQL, Familiar with AWS Docker and Cloud Computation using ComputeCanada
Quantitative Research	Computer networks, algorithm, Markov process, data structure, machine Learning, deep learning, and to an extent reinforcement learning
Organizational skills	Team-oriented, public speaker, diversity and inclusive advocate, active listener, program planner and administrator
Communication	English (fluent speaker), Persian (fluent speaker), German (reading and writing)

Projects

Drug review - A Data Analysis
A comprehensive data analysis with an application of natural language processing and machine learning tools to analyze reviews on drugs

- Extensive data analysis tools using **Pandas** library and associated modules have been used
- Using **Seaborn** and **Wordcloud** packages, advanced data visualizations for NLP implementation was applied
- Xgboost ML is deployed to evaluate the positive/negative sentiment in the reviews and the train model is tested and the corresponding evaluation metrics were analyzed
- The final version of the report is available on Kaggle

Sizing of Charging Stations Co-located with Solar Panel and Battery Storage
*A business project in collaboration with **ATCO Electric** company, Alberta, Canada*

- Held several business meetings since the start of the project and analyze the problem in depth.
- Devleloped a problem formulation and communicated with the business team making sure the problem is properly translated into algorithm and math
- The project was then migrated into a programming in Python
- Several edge cases were considered and tested
- The final version of the work was verified based on the real data provided by ATCO company
- The report was presented as a whitepaper to the industry partners (Alberta power industry simposuim)

Breast cancer diagnosis using Machine Learning
Supervised Machine Learning using classification methods from Scikit-learn python

- Implemented 7 different classification ML models to compare diagnostic accuracy
- Open source code and data analysis report is available here

Other Applied ML small projects

- Predict the salary of a company given some features in a real dataset using regression models from **scikit-learn** library.
- Develop an API to train a machine learning model to predict the job positions of a company based on available features in their dataset using decision tree regression model from scikit-learn Python.

C Coding in Linux
Operating Systems

- Developed a C programming code that shows the virtual memory allocation of a running process in Linux. [C Code]
- I wrote a C code to model the TCP communication between a server and several clients. This communication achieved via local and external IP addresses.
- Working with Valgrind in C/Linux.

Reddit Clone Web Application
Web Application with Angular

- Developed an application that allows users to post an article and a system is available for upvoting/downvoting
- The code follows ES6 developed using TypeScript

Simulator for Queueing systems [**Python Code**]
Computer Networks & Performance

- I developed an algorithm using various data structures including doubly linked lists, tensors, hash tables to model a queueing system
- An object-oriented programming API was developed to represent users and servers.
- I improved the coding so that it would have the best time complexity

Work Experience

Machine Learning Researcher **Sep 2020 — Present**
Department of Computing Science, University of Alberta *Edmonton, Alberta*

- Developed an API to solve optimization problems with `cvxpy, cvxopt python` for sizing of charging stations co-located with renewable energy resources. Real data is used as training data to evaluate the charging system modeling. Machine learning tools (`scipy, sklearn, pandas`) are used to extract queueing system metrics by learning from the data.
  supervisors: **Dr. Omid Ardakanian** and **Dr. Petr Musilek**

- Analyzing differential privacy in Machine learning methods for smart meters. A team-led by me worked on a machine learning API for home smart meters to evaluate differential privacy mechanism.
  supervisor: **Dr. Nidhi Hegde**

- Led a team-based project for APIC Hackathon competion where an API was developed in `python` to detect rooftop from Google Maps using computer vision tools and recommend the best sizing requirement for installation of solar panel. The team worked interactively through `git`.

- As a lab instructor, I developed an API in `python` to identify the anomaly in student's performance based on their experiment results and reports.

Python Teaching Assistant **Sep 2020 — Dec 2020**
Department of Computing Science, University of Alberta *Edmonton, Alberta*

- Worked collaboratively with a team of TAs to arrange the content of a 2nd-year undergraduate course on `python`.
- Provided solutions to the assignments and marked over 200 python coding assignments using automations (i.e `makefile`, using `python` API, bash command line etc.)
- Supervised undergraduate students with their python coding to improve their skills in coding and time complexity.
- Provided daily reports through `git`.

Data Science Researcher **Dec 2019 — Jun 2020**
Universität Stuttgart *Stuttgart, Germany*

- I Led three data science and probability theory projects on implementation of novel density estimation in power system analysis and using machine learning algorithms evaluate the feasibility of electric vehicle-to-grid power transaction.
- Supervised two computer science master students with their projects on smart energy systems.

Test Tech Lead **Jul 2019 — Nov 2019**
Surplec HV *Spruce Grove, Alberta*
- Led the Test Department to detect faults and short circuits in transformers using experiment data.
- Organized the testing environment in the department and made a structured data acquisition to capture/record/reuse the experiment data.
- I developed an API in MS Excel to verify that running experiments on transformers follow all standards.

Senior Teaching Instructor **Sep 2018 — Sep 2019**
Department of Electrical & Computer Engineering, University of Alberta, Edmonton, Canada
- Supervised 4 teaching assistants on delivering their work for a course in electric circuits
- Presented lectures on a weekly basis and clarified materials in the textbook
- Led students to solve their problem by providing hints and insights

Electrical Engineering Researcher **Sep 2012 — Sep 2015**
Department of Power & Control Engineering, Shiraz University, Shiraz, Iran
- Worked at Smart Grid Laboratory at Shiraz University on the issues related to probability modeling of renewable energy sources.
- Developed stochastic models to apply to random events happening in a real power system.
- Held regular meetings with the clients from the electric regional company in Shiraz to understand our partners problem and addressing the problem at our best accuracy.
- Used the real world examples and data to evaluate our proposal on probabilistic modeling of the power system.
- The result of my work is published in a journal article [see publication].

Solar Panel Design Engineer **Jan 2012 — May 2012**
Pars Rassam Electric
- Worked on a contract project to equip rural road signs with solar-powered LEDs
- Developed a prototype for the solar electrified LED to be mounted on road signs
- We had regular meetings with the business client
- As a contractor, we had limited time to deliver the project and so time management was a key success for me
- The project was deployed on a rural road with more than 100 signs

Education

Graduate Student in Computer Science, *University of Alberta, Edmonton, Canada* Sep 2020 - Sep 2022 [Expected]
M.Sc. in Electrical Engineering, *University of Alberta, Edmonton, Canada* Sep 2016 - Sep 2019
B.Sc. (with distinction) in Electrical & Computer Engineering, *Shiraz University, Shiraz, Iran* Sep 2009 - Sep 2013

Related Courses

Computer Networks & Performance	Operating Systems (Linux)	Privacy in Machine Learning	Algorithms II
Machine Learning A-Z (Udemy)	Data Science w/ Python (IBM)	Data structure	Neural Networks
Online optimization	Convex optimization (Stanford)	Economics & Finance in Engineering	

Certificates:
- Machine Learning with Andrew NG - **Coursera** Jan 2022
- Web Application with Angular - **Codewithmosh.com** Dec 2021
- Artificial Intelligence Foundations: Machine Learning - **LinkedIn** Dec 2021
- Version Control System, git - **github** Sep 2020
- Deep Learning A-Z - **Udemy** July 2019
- Machine Learning A-Z - **Udemy** May 2019
- Data Science with Python - **IBM Online** April 2019

Activities & Achievements

1st runner up APIC-Hackathon Jul 2021
Ranked among the top 100 graduate students to recieve Vanier Scholarship Winter 2018
Reached by more than 6000 users in Stackoverflow where I hold 200 reputation points. -
Active programmer in leetcode.com by solving algorithms in Python and C. -
President and CEO of a non-profit Iranian community based in Edmonton May 2017 - May 2018
Recipient of Graduate Recruitment Scholarship ($ 15000) Sep 2020 - Sep 2021
Travel Award grant from GSA ($ 500) and FGSR ($ 2000) Jul 2017