Amin Ravanbakhsh

Data Scientist

Status: Canadian Domestic Applicant
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Highlights of Qualifications

- Enhanced Big Data analytics capabilities and expertise in Spark and Databricks technologies as a Data Scientist during my Co-op program internship at BlackBerry.
- Developed proficiency in Natural Language Processing and large language models through the Automated Scientific Discovery project, focusing on symbolic regression with AI algorithms.
- Acquired comprehensive skills in deep learning, machine learning, and statistics via research projects and specialized coursework.
- Enhanced skills in data analysis and visualization through machine learning projects and symbolic regression research, employing Python, TensorFlow, and PyTorch to derive actionable insights from complex datasets
- Honed robust problem-solving capabilities while competing in the International Physics Olympiad in 2017.
- Acquired exceptional teaching and communication skills through multiple teaching assistantships in various courses and years of experience in teaching for Olympiad.

Education

University of Waterloo May. 2023 - Now
Master of Science in Computer Science

Sharif University of Technology Sep. 2017 - Jul. 2022
Bachelor of Science in Computer Engineering, GPA = 17.4/20

Young Scholars Club Jun. 2016 - Jul. 2017
Member of Iran's Physics Olympiad team

Honors and Awards

International Physics Olympiad (IPHO) Gold Medalist Jul. 2017
Iran's National Physics Olympiad Gold Medalist Jul. 2016

Work Experience

OneAlert BlackBerry
Machine Learning Software Developer *Jan. 2024 - Now*

As a Data Scientist with the Threat Hunting team, my role focuses on improving the Cylance Endpoint Security tool through Machine Learning to advance cybersecurity. My work, especially on the OneAlert project, involves analyzing large datasets and applying sophisticated ML and Data Analytics techniques. This effort enhances threat detection and hunting, leveraging Big Data analytics to extract insights that strengthen security and inform effective response strategies, ensuring superior protection against cyber threats.

Research Experience

Automated Scientific Discovery University of Waterloo
Research Assistant *Jan. 2023 - Now*

Elevating the potential of Symbolic GPT, our project introduces an advanced reasoning-based symbolic regression tool. This tool integrates large language models with comprehensive background knowledge and axioms, aiming for a breakthrough in interpretably uncovering hidden mathematical equations within physics datasets. Under the mentorship of Professor Ali Ghodsi, this initiative seeks to substantially augment Symbolic GPT's proficiency in identifying foundational equations, thereby advancing the domain of symbolic regression.

Deep Bayesian Neural Networks Sharif University of Technology
Undergraduate Research Assistant *Sep. 2021 - Jun. 2022*

Employed Bayesian Inference in conjunction with Thompson sampling to address the Multi-armed Bandit problem through Reinforcement Learning. My research involved a comprehensive survey of Bayesian algorithms, including Metropolis-Hasting, Hamiltonian Monte Carlo, Variational Inference, Monte Carlo Dropout, Bootstrap Sampling, etc., to determine the most suitable algorithm for designing a recommendation system based on industry-specific data. This research was undertaken under the guidance of Professor Seyed Abbas Hosseini.

Concept Drift Adaptive Systems for Federated Learning McGill University
Undergraduate Research Assistant *Jun. 2021 - Apr. 2022*

Utilized Attentive Aggregation with Federated Learning to develop a system robust against unexpected data changes, known as Concept Drift. The results of our research have been applied to the field of the Internet of Vehicles. As a contributing member of the team, I assisted the lead researcher, Amir Estiri, in conducting empirical tests on the attentive model.

Skills

Programming Languages: Python, C++, C, Java, SQL, Shell Scripting

Machine Learning Frameworks: PySpark, PyTorch, TensorFlow, Keras, Scikit-Learn

Technologies: Git, Docker, Databricks

Languages: English (TOEFL:97), Persian (Native)

Main Projects

Factorization Machines
Comparison of factorization machines method with common methods for classification and clustering about categorical data. Implementation of a recommendation system for YektaNet company's merchandise.

Brain Tumor Diagnosis
Employed the VGG16 network for detecting tumors in brain images, and utilized the Grad-CAM algorithm to visualize the underlying reasons for VGG16's malignant tumor detection.

Driver Drowsiness Detection Assistant
Designed and implemented a driver drowsiness detection system, leveraging a neural network to analyze facial expressions and issue warnings. Successfully deployed the project on an Arduino board.

Movie Recommendation System
Implemented a recommendation system using movie synopsis. The system includes a search engine that employs the TF-IDF (Term Frequency - Inverse Document Frequency) algorithm to find movies related to specific search terms. Furthermore, a Gaussian Mixture model is utilized to categorize movies into distinct clusters.

Teaching – Teaching Assisting

CE 401717: Machine Learning (Graduate course) Spring 2022, Fall 2021
Conducted tutorial sessions for over 50 students, enhancing their understanding of machine learning concepts and applications.

CE 40951.5: Intelligent Analysis of Biomedical Images (Graduate course) Spring 2022
Designed and graded practical and theoretical assignments for over 20 students.

CE 40417: Artificial Intelligence Fall 2021
Led tutorial sessions for over 100 students, facilitating deeper engagement with artificial intelligence principles and techniques.

CE 40181: Probability and Statistics Fall 2020
Conducted tutorial sessions and designed course notebooks for over 80 students, clarifying complex statistical theories and methodologies.

Physics Olympiad Teacher 2017 - 2023
Taught advance concept of physics in several top-ranking high schools of Iran.