ALIREZA GHAFFAR TEHRANI (AL Tehrani) (He/Him)

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EDUCATION

University of Waterloo, *Master of Math in Data Science* | Waterloo, ON, Canada **GPA: 86.0 / 100** 2022–2025

Thesis: Interpretable Machine Learning (IML) Methods: Classification and Solutions for Transparent Models

Amirkabir University of Technology, *BSc in Computer Engineering* **GPA: 86.1 / 100** 2017–2022

Thesis: Enhancing Machine Learning Robustness through Adversarial Machine Learning Techniques

Tehran University, *BSc in Statistics* **GPA: 93.6 / 100** 2010–2014

EXPERIENCE

Tax Templates Inc., *Software Developer & Data Intern* | Aurora, ON, Canada 2024 - Present

- Developed and enhanced web applications by implementing new features, modifying existing functionalities, and ensuring seamless integration with pre-existing components for optimal performance. Additionally, conducted quality assurance testing to identify areas for improvement and enhance user experience and application efficiency.
- Designed and implemented API integrations for financial data retrieval and insurance product comparisons, optimizing data handling, improving calculation accuracy, and ensuring reliable financial analysis.

University of Waterloo, *Teaching & Research Assistant* | Waterloo, ON, Canada 2022 - 2024

- Taught Statistics and Computer Science courses, utilizing Python and R to impart key data science and machine learning concepts. Assessed student projects and papers while crafting detailed lesson plans and quizzes to enhance learning outcomes.
- Led research to enhance and fine-tune ML models with real-world data, focusing on deep learning and interpretable techniques to improve model accuracy and validation.

Gradient Co., *Data Analyst & Machine Learning Intern* 2021 - 2022

- Developed AI/ML predictive models in Python, utilizing TensorFlow, PyTorch, Scikit-learn, XGBoost, and Keras libraries, and forecasted capital market trends through sophisticated deep learning and data engineering techniques.
- Enhanced operational efficiency by designing and implementing scalable machine learning algorithms that improved model performance.

Intelligence Computing Base Inc., *Software Tester & Software Developer* 2020 - 2021

- Developed and optimized software applications using Python, enhancing system performance and user satisfaction.
- Conducted thorough automated and manual testing of software solutions, ensuring high reliability and compliance with development standards.

Department of Education & Training Center, *High School Mathematics Teacher* 2014 - 2022

- Taught a diverse curriculum encompassing Statistics, Probability, Combinatorics, Enumeration, Calculus, Algebra and Algorithms.
- Deepened my expertise in Mathematics and Statistics through hands-on instruction and curriculum development.

SKILLS

Data Science:	AI, ML, Predictive Modeling, EDA, ETL, Spark, Hadoop, Data Pipelines, MS Excel, Tableau, Power BI
LLMs, Search & Agents:	NLP/NLU, Transformers/LLMs (multimodal), Generative AI, Embeddings, RAG/Semantic Search, Ranking/Retrieval, Agent Architectures, Vector Databases, LLM APIs (OpenAI, Anthropic)
Post-training & Optimization:	SFT, Preference Optimization/RLHF, Reinforcement Learning, Quantization, Distillation/Pruning
Frameworks & Libs:	PyTorch, TensorFlow, Keras, scikit-learn, Hugging Face (Transformers/Datasets/Tokenizers)
Languages:	**Python**, JavaScript, R, Java, C, MATLAB
Distributed & Data:	PyTorch Distributed/Ray, Large-scale Data Analysis, SQL, PostgreSQL, Azure Cosmos DB, MongoDB, Vector DBs
MLOps & Platforms:	Model Serving (APIs/Microservices), Batch/Streaming Inference, Monitoring/Observability, A/B Testing & Experimentation, Feature Store, Model Registry, CI/CD, Docker, Kubernetes, AWS, GCP, Git
Web & APIs:	FastAPI, REST APIs, HTML/CSS, React, Next.js
Software Eng.:	Data Structures, OOP, SDLC, Agile, Code Review, Testing/Quality, Algorithms, Pair Programming
Soft Skills:	Communication, Cross-functional Collaboration, Product Mindset, Ownership, Problem Solving, Fast Learner, Adaptable, Comfortable with Ambiguity, On-call Readiness, Documentation

CERTIFICATES

- **Git:** Mastered essential Git functionalities to enhance version control and collaboration | Udemy
- **Data Analysis:** Gained expertise in Pandas, Sci-kit Learn, Numpy, and data visualization with Seaborn & Matplotlib | Coursera
- **Time Series Data Analysis:** Acquired skills in using Python libraries for time series forecasting and analysis | Udemy
- **Data Visualization with Matplotlib:** Developed proficiency in visualizing complex datasets using Matplotlib | Udemy
- **Machine Learning A-Z:** Learned to design and implement machine learning algorithms in both Python and R | Pytopia

SELECTED PROJECTS

Stock Market Trend Prediction | CNNs and PySpark | *CS631 Project, Fall 2024, UWaterloo*

- Developed a machine learning model using Convolutional Neural Networks (CNNs) and PySpark to analyze financial time series data and identify profitable trading signals.
- Maximized returns on a simulated $1 million investment, leveraging a 311 MB distributed dataset, achieving a 15% increase in simulated annual return compared to benchmark approaches.

Analytics Competition: Credit Card Fraud Detection | ML Techniques | *Scotiabank event, Winter 2023, UWaterloo*

- develop credit card fraud detection models using Random Forest and Logistic Regression, focusing on anomaly detection in a supervised learning paradigm to reduce fraud.
- Awarded Best Team Collaboration for refining the model's accuracy rate of 93.67% and reducing the false positives by 9%, leading to enhanced security in simulated transactions.

Elastic Search Engine Implementation for Text Document Retrieval | *Information Retrieval, Spring 2022, Polytechnic*

- Developed and deployed an Elasticsearch-based search engine that efficiently indexes and retrieves text documents through optimized text processing and advanced querying functionalities.
- Enhanced search accuracy and performance by implementing complex query handling with Boolean operators and developing ranking algorithms to prioritize document relevance.

Database System for Online Streaming Platform | SQL, Python, User Authentication | *Database Design, Spring 2022, Polytechnic*

- Engineered a SQL database for a streaming service, managing user registrations, content categorization, and access control, incorporating advanced queries and user authentication procedures.
- Developed a dynamic VIP subscription model that adjusts content access based on user payment, improving service offerings and operational efficiency.

Persian Language Airline Booking Chatbot | NLP, Python | *Internship, Winter 2022*

- Developed an NLP-based chatbot tailored to the Persian language, streamlining airline bookings and integrating with databases for enhanced reservation processing.
- Improved chatbot interaction and response accuracy by 15% through user feedback, optimizing customer service and booking experience, ultimately reducing booking errors by 10%.

Evolutionary Game Theory & ML Integration | Python, Pygame | *Computational Intelligence, Fall 2021, Polytechnic*

- Engineered a Python/Pygame-based evolutionary game simulation to model adaptive behaviors, utilizing genetic algorithms for optimizing agent strategies.
- Created a dynamic environment with self-adjusting parameters, which facilitated adaptive decision-making in agents, enhancing their response to changing conditions in the simulation.

E-Commerce Web Application | HTML, CSS, JavaScript, SQL | *Web Engineering, Fall 2021, Polytechnic*

- Developed a responsive full-stack e-commerce web application using HTML, CSS, and advanced JavaScript, focusing on enhancing user interfaces and real-time data processing.
- Implemented robust backend solutions and a complex database system to ensure secure, dynamic management of user data and product content.

Fuzzy C-Means Clustering for Data Classification | Python | *Computational Intelligence, Winter 2021, Polytechnic*

- Developed and optimized a Fuzzy C-Means clustering algorithm in Python to classify multi-dimensional datasets, enhancing data categorization by adjusting fuzziness parameters for more accurate decision-making.
- Implemented advanced data pre-processing and fine-tuned clustering models to improve classification boundaries, providing increased interpretability of the clustering results.

AI Project on Persian Poet Classification Using LMs | NLP, Python | *Artificial Intelligence, Winter 2020, Polytechnic*

- Created and refined an NLP-based classification model for Persian poetry, employing uni-gram and bi-gram language models to identify poet styles, utilizing extensive testing to optimize classification accuracy.
- Conducted feature extraction and model validation, ensuring the classification model performed effectively across diverse texts, highlighting capabilities in linguistic feature analysis.

AWARDS & HONORS

International Master's Award of Excellence (IMAE) Awarded for academic excellence and potential in graduate studies at the University of Waterloo, Recognizes outstanding international students enrolled in a research-based graduate program. Waterloo, ON, Canada — 2022 - 2024

Champion Team in the Explanatory Data Analytics (EDA) section in the Statistical Society of Canada (SSC) competition Demonstrated expertise in data interpretation and provided actionable insights from complex datasets. Ottawa, ON, Canada — 2023

Runner-up team in the Statistical Society of Canada (SSC) competition on "Understanding how Canada's economy might be impacted by climate change". Led data extraction and analysis for actionable insights. Ottawa, ON, Canada — 2023

Secretary and Volunteer Member of the Student & Postdoc Advisory Committee (SPAC) in Computer Science Community of Canada (CS-Can) — 2023 - 2024