Samaneh H. Moghaddam

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Summary

Lead Data Scientist, Senior Machine Learning Engineer and Applied Researcher with 8+ years spanning AI product development, machine learning engineering, and large-scale NLP research. Expert in building, deploying, and maintaining production ML systems across financial services, Social Media analysis, and adaptive language technologies. Strong background in credit risk modeling, personalization, graph-based modeling, and agentic AI. Proven ability to translate business problems into ML solutions, lead cross-functional teams, and build interpretable and scalable AI systems end-to-end.

Technical Skills

Programming: Python, SQL, C++, Bash

ML & DL: PyTorch, Transformers, HuggingFace, Scikit-learn, PyG

Data Science: Pandas, NumPy, Matplotlib, Seaborn

Infrastructure: Docker, Git, Slurm, HPC, Azure (adaptable to AWS & GCP)

Expertise: NLP, LLMs, Agentic AI, Anomaly Detection, Personalization, Predictive Modeling, Risk Analytics, Applied AI for Products

Methodologies: Agile, SAFe, Product Requirements, Cross-functional Leadership

Experience

Postdoctoral Fellow (NLP, LLMs, Applied ML) 2023 – Present
University of Toronto & Vector Institute (Affiliate) *Toronto, Canada*

- Lead ML research on adaptive NLP systems targeting online risk and abusive language.
- Owned end-to-end ML life-cycle: data engineering, model training, drift analysis, deployment on HPC, evaluation.
- Designed a classification model, a graph-aware, multimodal transformer integrating textual, relational, and temporal signals.
- Built an agentic pipeline for concept drift detection and progressive model adaptation.
- Supervised RAs, led multi-institution collaborations, and communicated research to technical and non-technical audiences.

Product Management Specialist & Lead ML Scientist 2022 – 2023
Behsazan Mellat (ICT Subsidiary of Mellat Bank) *Tehran, Iran*

- Served as Product Owner for two core microservices—ML-driven credit scoring and rule-engine–based risk management—central to Mellat Bank's lending and BNPL decision pipelines.
- Led the development of the computational credit scoring models, overseeing feature engineering, model experimentation, validation, and integration into real-time scoring APIs.
- Designed and maintained a flexible, policy-aware rule engine for risk management, incorporating internal governance rules, regulatory requirements, and governmental directives.
- Enabled adaptation of risk rules to diverse B2B client needs, supporting business-specific constraints while ensuring consistency, transparency, and compliance across lending workflows.

Data Scientist — Social Media & Digital Analytics 2018 – 2019
Jeeko Educational Group *Tehran, Iran*

- Designed and implemented a social media analytics platform integrating data collection pipelines, network analysis, and predictive modeling to understand audience behavior.
- Developed ML models for engagement prediction, audience segmentation, and content performance forecasting.
- Conducted competitor and influencer network mapping using graph-based analysis to uncover interaction patterns, influence dynamics, and strategic positioning.
- Delivered actionable, data-driven recommendations that informed personalization strategies, improved targeting accuracy, and supported long-term digital marketing initiatives.

Product Owner & Senior Software Analyst 2007 – 2012
Yaas Arghavani (ICT Subsidiary of Mellat Bank) *Tehran, Iran*

Transaction Integrity Monitoring System — Product owner of the an enterprise-grade platform for real-time monitoring of card-based banking transactions across internal systems, payment gateways, and settlement networks. Led development of end-to-end flow validation and discrepancy detection to enhance reliability, reconciliation accuracy, and transaction integrity at national scale.

Electronic Agriculture Insurance Platform — Served as system analyst for a nationwide digital insurance system supporting policy issuance, claims processing, and indemnity calculation workflow.

Performed full requirements engineering, and cross-team coordination for national financial and insurance platforms, ensuring scalability, robustness, and compliance with operational standards.

Selected Projects

Production Credit Scoring System (Financial Services) — Led development of real-time credit scoring models integrated with Mellat Bank's lending APIs and BNPL systems; engineered feature pipelines, monitoring dashboards, and interpretable model logic.

Card Transaction Monitoring & Discrepancy Detection System — Led the design and development of an enterprise-grade system for real-time and monitoring of card-based banking transactions across internal systems, payment gateways, and settlement platforms leading to discrepancy (anomaly) detection system.

Malicious AI Agent Detection — Developed multimodal computational model using graph-based and behavioral feature engineering to identify malicious AI agents (social bots) on large-scale social media platforms. Designed scalable and robust pipelines for data collection, feature extraction, anomaly detection, and early-stage detection using relational, temporal, and content-level signals.

AbuseBERT (HuggingFace Release) — Built a LLM based computational model for robust abusive language detection; improved generalization via bias reduction.

Semantic Drift Detection Agent (Agentic AI) — Designed an LLM-driven agent that detects emerging concepts in streaming social data and triggers model retraining decisions.

Certifications

Artificial Intelligence on Microsoft Azure — Microsoft (2025). Skills: Azure ML, cloud deployment, AI engineering.

Machine Learning Software Foundations — Data Science Institute, University of Toronto (2025). Skills: pipeline engineering, end-to-end ML systems.

Big Data, Artificial Intelligence, and Ethics — University of California, Davis (2023).

Computational Social Science Methods — University of California, Davis (2023).

Exploratory Data Analysis for ML — IBM (2023).

Supervised ML: Regression — IBM (2023).

Agile Planning for Software Products — University of Alberta (2023).

Software Processes & Agile Practices — University of Alberta (2023).

Client Needs and Software Requirements — University of Alberta (2023).

Introduction to Software Product Management — University of Alberta (2023).

Reviews & Metrics for Software Improvements — University of Alberta (2023).

Education

University of Toronto 2023 – Present
Postdoctoral Research — Adaptive and Robust Detection of Abusive Language *Toronto, Canada*

Shahid Beheshti University 2016 – 2022
Ph.D. in Computer Engineering — Detecting fake accounts operated by malicious AI agents (Social bots) *Tehran, Iran*

Selected Publications

Available upon request (IEEE TDSC 2022, CHBR 2025, CASCON 2025, others)