

# 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)

*University of Toronto & Vector Institute (Affiliate)*

Sep 2023 – Present  
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

*Behsazan Mellat (ICT Subsidiary of Mellat Bank)*

May 2022 – Sep 2023  
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

*Jeeko Educational Group*

Mar 2018 – Feb 2019  
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**  
Yaas Arghavani (ICT Subsidiary of Mellat Bank)

Sep 2007 – Sep 2012  
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

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**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

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**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

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**University of Toronto**  
Postdoctoral Research – Adaptive Multimodal AI for Abuse Detection

2023 – Present  
Toronto, Canada

**Shahid Beheshti University**  
Ph.D. in Computer Engineering – Detection of Malicious AI Agents on Social Media

2016 – 2022  
Tehran, Iran

## SELECTED PUBLICATIONS

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