

Mostafa Miandari Hossein

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Summary

PhD candidate with production ML experience, focused on human-technology interaction. Research in computational social science, NLP, and applied LLM systems. Uncovered new patterns in 1M+ unstructured social media posts using LLM extraction and embedding analysis. Industry background in user analytics (40M users), A/B testing, and predictive modeling. Looking to build AI systems that augment human decision-making.

Education

University of Toronto

Toronto, Canada

Ph.D. IN PSYCHOLOGY

2020 - Now

- GPA: 4 / 4
- Dissertation: "Platform effects on emotion, information content, and norm-responsiveness in social media". Studied how communication patterns differ across platforms and what drives those differences. Applied traditional NLP methods, LLM-based extraction, embedding analysis, clustering, and mixed-effects modeling to answer these questions. Advisor: Cendri Hutcherson
- Notable Courses: Human-Computer Interaction, Introduction to Advanced Statistical Methods

University of Tehran

Tehran, Iran

M.Sc. IN ELECTRICAL ENGINEERING - BIO-ELECTRICAL ENGINEERING

2015 - 2017

- GPA: 3.82 / 4, Ranked 1st
- Dissertation: "Analysis and modeling of human interactive learning in a probabilistic markov environment" Studied how social interaction affects the balance between deliberate planning and habitual decision-making in a sequential learning task. Applied reinforcement learning and statistical modeling. Advisors: Dr. Majid Nili Ahmadabadi, Dr.Bahador Bahrami
- Notable Courses: Machine Learning, Reinforcement Learning, Image Processing, Introduction to Cognitive Neuroscience

Experiences

Neuromatch Academy — NeuroAI Course

Remote

PROJECT ASSISTANT, Selected as project TA (<10% acceptance) for NeuroAI, Neuromatch's advanced course.

Mentored students across 5 time zones in formulating research questions at the intersection of neuroscience and artificial intelligence.

2025

Parametric Lab

Toronto, Canada

DATA ANALYST, DATA ANALYST, built event detection pipeline to identify significant blockchain activity (large transactions, NFT sales). Enabled users to track notable market events without monitoring raw transaction data.

2023

User Insight & Advertising Teams - Cafe Bazaar

Tehran, Iran

DATA ANALYST & RESEARCHER, analyzed user behavior in an app marketplace with 40 million users. Built classification models for user segmentation to improve product personalization and ad targeting. Designed and ran A/B experiments to optimize conversion rates.

2020 - 2021

People Analytics Team- Cafe Bazaar

Tehran, Iran

HUMAN RESOURCES ANALYST, built predictive models for employee performance, retention, and attrition risk.

Analyzed survey, performance, and manager report data to identify risk patterns; worked with leadership to develop interventions.

2019 - 2020

SRC Accelerator, SYNTech Technology and Innovation Center

Qazvin & Tehran, Iran

DATA SCIENTIST, developed ML models for a shopping aggregator platform. Built recommender systems and visual retrieval models for fashion-item localization (image-to-product matching).

2017 - 2018

Farabi Brokerage Co.

Tehran, Iran

DATA SCIENTIST, developed stock price movement prediction models. Evaluated multiple approaches including deep learning (LSTM) and regression-based methods.

2017

Projects

Personal Knowledge Base System MCP Server



Built RAG infrastructure for natural-language Q&A over personal knowledge archives (papers, videos, notes). Addresses the problem of querying and synthesizing information from large volumes of consumed content. Implements hybrid retrieval, query decomposition, and MCP integration.

Adaptive Qualitative Interviewer

Built an LLM-powered system for behavioral research that generates adaptive follow-up questions based on participant responses. Addresses the tradeoff between questionnaire scalability and interview depth. Implements LangGraph, configurable experiment protocols, and REST API / web UI deployment.

Gritful — Multiplayer Habit Tracking Platform

Building a habit tracking platform that combines custom goal definition with multiplayer competition — features that don't typically coexist in existing apps. Implements configurable scoring algorithms (binary, scaled, tiered), real-time leaderboards, and streak mechanics. Uses Next.js and Supabase.

Multi-Platform Social Media Data Pipeline

Built infrastructure for collecting and annotating data across social media platforms. Enables cross-platform comparison using unified schemas. Implements Playwright scraping, FAISS vector storage, and LLM-based classification.

Behavioral Modeling in Social Dilemma Games

Developed hierarchical RL models for human social decision-making in an online multiplayer game. Combines behavioral modeling with realistic gaming environments. Decision Neuroscience Lab, U of T.

Market Intelligence & Event-Driven Trading System

Built two-part trading infrastructure: (1) NLP pipeline that scrapes and analyzes market-moving accounts and news sources, paired with custom volume/flow indicators (PineScript) for discretionary analysis; (2) automated execution system for scheduled economic releases (e.g., CPI, NFP) that fetches data at publication and trades on actual-vs-expected delta.

Skills

LLMs & NLP: Prompt Engineering, MCP, Agentic Coding, LangChain, LangGraph, Llamaindex, Chromadb, FAISS, Embeddings

ML & Deep Learning: Reinforcement Learning, Clustering, PyTorch, Keras, Scikit-learn, XGBoost

Data Analysis & Experimentation: A/B Testing, Mixed-Effects Modeling, Bayesian Inference, Pandas, Metabase

Programming: Python, MATLAB, SQL, R, TypeScript, C#

Other: Git, FastAPI, Pydantic, Docker, UV, Streamlit, Supabase, Playwright

Publications

Hossein, M. M., Hutcherson C., (Submitted). Emotional Fingerprints Across Platforms: Disentangling User from Platform Effects in Political Discourse

Hossein, M. M., Ershadmanesh, S., Vahabie, A. H., & Ahmadabadi, M. N. (Submitted). The effects of directed and free self-monitoring on goal-directed and habitual decision-making.

Saeedpour, S., Hossein, M. M., Deroy, O., & Bahrami, B. (2023). Interindividual differences in Pavlovian influence on learning are consistent. Royal Society Open Science, 10(9), 230447.

Navidi, P., Saeedpour, S., Ershadmanesh, S., Hossein, M. M., & Bahrami, B. (2023). Prosocial learning: Model-based or model-free?. Plos one, 18(6), e0287563.

Ershadmanesh, S., Miandari, M., Vahabie, A.-H., & Nili Ahmadabadi, M. (2019). Higher meta-cognitive ability predicts less reliance on over confident habitual learning system. bioRxiv, 650556

Research Interests

● Decision-making ● Human-AI Interaction ● Computational Social Science ● Applied NLP/LLMs ● Behavioral Modeling

Honors & Awards

2020	Burton Graduate Scholarship as an incoming student with first class academic standing.	<i>University of Toronto</i>
2020	Doctoral Recruitment Award as an incoming student with first class academic standing.	<i>University of Toronto</i>
2020	Graduate Scholarship of University of Toronto for international doctoral students.	<i>University of Toronto</i>
2019	Graduate Scholarship of Dartmouth College for international students.	<i>Dartmouth College</i>
2018	Becoming a Member of Iran's National Elites Foundation (INEF)	<i>Domestic</i>
2017	Ranked 1st among all graduate students of Bio-electrical Engineering in M.Sc. program, class of 2014	<i>University of Tehran</i>
2015	Graduate Scholarship from Cognitive Science and Technologies Council for my master thesis	<i>Domestic</i>
2014	Ranked 98th in nationwide M.Sc. entrance exam among more than 30,000 participants	<i>Domestic</i>
2013	Ranked 13th in international Data mining cup in Germany with Amirkabir U. of Tech. team	<i>International</i>