

Mohammad Abolnejadian

Master of Mathematics in CS (HCI Lab) @ University of Waterloo | 📍 Waterloo, Ontario, Canada

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Education

University of Waterloo

Master of Mathematics (Thesis, Co-op) in Computer Science

GPA: 97.25/100

Jan. 2025 – Present (*Expected Apr. 2027*)

Waterloo, Canada

Sharif University of Technology

Bachelor of Science in Computer Engineering

Overall GPA: 19.08/20 (Major GPA : 19.39/20)

Top-ranked university in Iran, according to QS ranking 2024

Sep. 2019 – July 2024

Tehran, Iran

Research Interests

- Human-Computer Interaction
- Information Visualization
- Applied AI
- Human-Centered AI

Research Experience

GRA – Supporting Data-rich Conversations with AI

Supervisor: [Dr. Matthew Brehmer](#) @ [Ubix Group](#) | [HCI](#) • [GenAI](#) • [InfoVis](#)

M.Math. Thesis Project

Jan. 2025 – Ongoing

University of Waterloo, CS HCI Lab

- Designing a **mixed-initiative system** to enhance synchronous collaborative decision-making by automatically retrieving, synthesizing, and presenting **historical data as succinct insights** within the conversation periphery
- I leverage a **multi-agent RAG pipeline** integrated with ASR and ML models stack for this project.

URA – AI for Sports Injury Prevention through Pose Analysis

Supervisor: [Dr. Bardia Safaei](#) @ [RADIANT Lab](#) | [HCI](#) • [GenAI](#) • [CV](#)

B.Sc. Thesis Project

Dec. 2023 – Jun. 2024

Sharif University of Technology

- Developed **SquatSage** (formerly TrAIner), a coaching application with the goal of preventing sports injuries by providing real-time squat analysis using **computer vision** (BlazePose) and personalized feedback via a **multimodal LLM**. Evaluated through a 14-participant HCI study, with a **4.5/5** rating from users on effectiveness, culminating in a successful thesis defense (**19.8/20**).

URA – Mining Software Repositories for Code Quality Analysis

Supervisor: [Dr. Abbas Heydarnoori](#) @ [ISE Lab](#) | [MSR](#) • [Data Science](#)

Aug. 2023 – Dec. 2023

Sharif University of Technology

- Curated **DistilKaggle**, a dataset of **542,051 Jupyter notebooks** with **34 extracted code quality metrics**, including External API Popularity and Cyclomatic Complexity. Built a Random Forest classifier to predict developers' Kaggle performance tiers, achieving a **57% F1 score** in the paper's sample application; distilled **300GB+ of raw notebooks into a 3GB dataset** for accessible research use. [\[Dataset\]](#)

RA – LLM for Personalized Education

Supervisor: [Dr. Sharareh Alipour](#) | [HCI](#) • [GenAI for Education](#)

Jun. 2023 – Oct. 2023

Tehran Institute for Advanced Studies (TeIAS)

- Led the development and evaluation of an adaptive learning platform for personalized programming instruction. In a comparative study with **85 high school students**, the AI-assisted group achieved **28.3% higher mean scores on the third quiz** than the traditional-instruction group (74.4 vs. 58). Students in the AI-assisted group reported preferring the approach over traditional instruction.

URA – IoT Task Scheduling for Energy Efficiency

Supervisor: [Dr. Mohsen Ansari](#) @ [CPS Lab](#) | [CPS](#) • [Fog Computing](#)

May 2023 – Sep. 2023

Sharif University of Technology

- Implemented MoTiCPS, a novel **metaheuristic** scheduling algorithm for IoT-integrated Cyber-Physical Systems based on the Osprey Optimization Algorithm in iFogSim, demonstrating a **39% reduction in energy consumption** and a **32% increase in task success rates** over existing methods. [\[Code\]](#)

Publications

- **Mohammad Abolnejadian**, Matthew Brehmer. *InsightToast: Proactive Information Retrieval & Glanceable Visualization in the Side Channel of Data-Rich Meetings*. ACM Symposium on User Interface Software and Technology (UIST '26), forthcoming, 2026. [Paper]
- **Mohammad Abolnejadian**, Shakiba Amirshahi, Matthew Brehmer, Anamaria Crisan. *AInsight: Augmenting Expert Decision-Making with On-the-Fly Insights Grounded in Historical Data*. 7th ACM Conference on Conversational User Interfaces (CUI '25), pp. 1–7, 2025. [Paper]
- Abolfazl Younesi, Elyas Oustad, **Mohammad Abolnejadian**, Mohsen Ansari, Alireza Ejlali. *MoTiCPS: Energy Optimization on Multi-Objective Task Scheduling in IoT-Integrated Cyber-Physical Systems*. IEEE Transactions on Sustainable Computing, 10(4), pp. 744–755, 2025. [Paper]
- **Mohammad Abolnejadian**, Sharareh Alipour, Kamyar Taeb. *Leveraging ChatGPT for Adaptive Learning through Personalized Prompt-based Instruction: A CS1 Education Case Study*. CHI Conference on Human Factors in Computing Systems, Extended Abstracts (CHI '24), Case Studies, pp. 1–8, 2024. [Paper]
- Mojtaba Mostafavi Ghahfarokhi, Arash Asgari, **Mohammad Abolnejadian**, Abbas Heydarnoori. *DistilKaggle: A Distilled Dataset of Kaggle Jupyter Notebooks*. 21st International Conference on Mining Software Repositories (MSR '24), Data and Tool Showcase Track, pp. 647–651, 2024. [Paper, Dataset]
- Nader Zare, Mohsen Sadeghipour, Ashkan Keshavarzi, Mahtab Sarvmeili, Amin Nikanjam, Reza Aghayari, Arad Firouzkoochi, **Mohammad Abolnejadian**, Sina Elahimanesh, Amin Akhgari. *Cyrus 2D Simulation Team Description Paper 2018*. RoboCup 2018, Soccer Simulation 2D League, Team Description Paper, 2018. [Paper]

Work Experience

Applied AI Scientist Intern

May 2026 – Present

Verily Health

Waterloo, ON

- Developing an **agentic clinical framework** grounded in clinical knowledge and self-improving agents, reducing development time for new agents **from months to weeks** while improving auditability.
- Designed and prototyped a **multi-agent pipeline** for composing clinical guidelines from trusted sources, enabling clinicians to develop protocols interactively and supporting collaboration between data science and clinical teams.
- Extended a clinical **knowledge graph** by curating and ingesting **1M+ clinical concepts**, their associations, and related encyclopedic knowledge, enabling a MedQA agent to achieve **90% accuracy**.

Software Engineer

July 2022 – May 2023

Cafe Bazaar

Tehran, Iran

- **The biggest Android marketplace in Iran**, with over 50M active monthly users (as of 2023).
- As a **backend developer** for the payment services cross-functional team, I contributed in **maintaining** the **in-app payment service** and the **development** of a new gift card storefront.

Full Stack Developer

Sep. 2021 – Dec. 2022

Pezhvak AI Startup

Tehran, Iran

A division of Dr. Abolfazl Motahari's lab

- Developed an **NLP platform** to showcase its usages such as Speech to Text, Speaker Identification, etc.
- Used a full-stack development kit in the process, using tools such as Flask SDK, Flutter SDK, etc.

Honors & Awards

University of Waterloo Graduate Scholarships

2025 – 2027

Awarded for academic excellence upon admission to the M.Math. program

Waterloo, Canada

International Master's Award of Excellence (IMAE) – \$2'500 CAD/term

Paul Dirksen Memorial Graduate Scholarship in Computer Science – \$10'000 CAD

International Robocup Competition

Jun. 2018

2nd Place, Soccer 2D Simulation League

Montreal, Canada

Cyrus Team

Iran Open Robotics Competition

Apr. 2018

1st Place, Soccer 2D Simulation League

Tehran, Iran

Cyrus Team

1st Place, Soccer 2D Simulation League - Starter

AE Team

Asia-Pacific Robocup Competition
2nd Place, Soccer 2D Simulation League - Starter
Cyrus Team

Dec. 2018
Kish, Iran

University Entrance Exam (Concours)
ranked **12th nationally**, Mathematics field
Among more than 164,000 students (the top $\approx 0.007\%$)
ranked **7th nationally**, English Literature field
Among more than 165,000 students (the top $\approx 0.004\%$)

Sep. 2019
Iran

Teaching Experience

University of Waterloo

2025–2026

Instructional Apprentice

CS 136L: Tools and Techniques for Software Development (Winter 2026).

Teaching Assistant

Human-Computer Interaction (Fall 2025); Software Design and Architecture (Spring 2025); Introduction to Computer Science 2 (Winter 2025).

- Mentored project teams in Human-Computer Interaction and Software Design and Architecture; assessed student work, including examinations and assignments in Introduction to Computer Science 2.

Sharif University of Technology

2020–2023

Teaching Assistant

Compiler Design — Lead TA (Spring, Fall 2022; Spring, Fall 2023); Data Structure & Algorithms (Fall 2023); Information Retrieval (Fall 2023); Engineering Probability & Statistics (Fall 2021; Fall 2023); Embedded Systems (Spring 2023); Computer Simulation (Spring 2023); Software Engineering (Spring 2023); Linear Algebra (Spring, Fall 2022; Spring 2023); Operating Systems (Fall 2022); Computer Language & Organization (Fall 2021; Spring 2022); Advanced Programming (Fall 2020; Fall 2021).

- Designed Compiler Design projects, guided students, and graded examinations across four terms.
- Designed assignments and final projects across multiple courses; developed learning materials for Linear Algebra.
- Led the assignment-grading team for Engineering Probability & Statistics.

Remarkable Projects

Real-Time Gesture-Controlled Raspberry Pi Car with YOLOv8 | [code](#)

Spring 2023

Supervisor: Dr. Alireza Ejlali

The project involves building a prototype car using Raspberry Pi and controlling its movement using hand gestures. The hand gestures are detected using the YOLOv8 model while the hardware implementation involved packaging and using different modules with Raspberry Pi.

File Manager Mobile Application | [code](#)

Spring 2022

Supervisor: Dr. Mehdi Mostafazade

This project is an **Android mobile application** that can be used as a file-sharing and management platform. As a part of a software team, I was responsible for UX/UI (using Figma) and Frontend (Using Flutter) development.

Search Engine for Spiritual Scriptures | [code](#)

Spring 2022

Supervisor: Dr. Ehsaneddin Asgari

Leveraged **TF-IDF**, **Fasttext**, **Transformers** embeddings and **Elastic search** to construct a search engine for Spiritual Scriptures.

CMinus Compiler | [code](#)

Fall 2021

Supervisor: Dr. Gholamreza Ghassem-Sani

In this project, we created a one-pass compiler for the C-minus programming language (a simplified version of the C programming language). This project was done in three phases: We developed the **scanner** in the first phase, the **parser** in the second phase, and finally the **intermediate code generator** in the third phase

Technical Skills

AI & Machine Learning: PyTorch, TensorFlow, Scikit-Learn, NLTK, SciPy, Hugging Face, LangChain, MediaPipe, OpenCV
Programming: Python, Java, JavaScript, C/C++, SQL, Dart, Swift, Bash
Research & HCI: User Study Design, Statistical Analysis, A/B Testing, Info Visualization
Frameworks & Tools: Flask, Django, FastAPI, Flutter, React, Git, Docker, Kubernetes, PostgreSQL, L^AT_EX, Figma, Adobe XD, Raspberry Pi

Language Proficiency

Persian: Native
English: Fluent
TOEFL iBT®: 108/120 (Reading: 26/30, Listening: 30/30, Speaking: 25/30, Writing: 27/30)
(Oct. 2023)
GRE® General: Verbal: 146/170, Quantitative: 168/170, Writing: 3.5/6
(Nov. 2023)

Notable Courses

Human-AI Interaction <i>UofW, Dr. Anamaria Crisan</i>	99/100	Multiagent Systems <i>UofW, Dr. Kate Larson</i>	95/100
Behavioural Decision-Making <i>UofW, Dr. Selçuk Onay</i>	100/100	Modern Information Retrieval <i>SUT, Dr. Ehsaneddin Asgari</i>	20/20
Object-Oriented Design <i>SUT, Dr. Raman Ramsin</i>	20/20	Design of Algorithms <i>SUT, Dr. Masoud Seddighin</i>	20/20
Artificial Intelligence <i>SUT, Dr. Mohammadhossein Rohban</i>	20/20	Linear Algebra <i>SUT, Dr. Hamidreza Rabiee & Maryam Ramezani</i>	20/20

* SUT: Sharif University of Technology, UofW: University of Waterloo

Service & Leadership

Conference Peer Reviewer ACM CHI (2027); ACM UIST (2026).	
Mentor — Women in Mathematics Directed Research Program University of Waterloo, Faculty of Mathematics	Jan. 2026 – Apr. 2026 <i>Waterloo, ON</i>
• Mentored four undergraduates on HCI research methods (mixed-methods analysis and user studies), data sourcing and curation, and LLM and retrieval-augmented generation (RAG) concepts.	
Graduate Student Representative <i>School of Computer Science Council, University of Waterloo</i>	Oct. 2025 – Present
• Voting member representing graduate students in the department’s governance alongside faculty and school officers.	
Technical Staff <i>International Collegiate Programming Contest (ICPC) West Asian contest</i>	June 2023
• Prepared competition systems for over 150 participants.	
Sponsorship Coordinator <i>Webelopers Competition</i>	May 2022
• Helped the event to acquire two sponsors Beneficial experience to delve into negotiations and signing contracts	

Extra Curricular Activities

Gym Rat, never miss a leg day; **NBA fanatic**, never miss a game; **Tech nerd**, always up on the latest; **UI designer**, making things pop; **Running addict**, gotta keep moving; **Social butterfly**, squad magnet