

MOHAMMAD ABAEIANI

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About Me

Computer Science & Engineering Master's student at the University of Oulu (**GPA: 4.82/5**) graduating in June 2026. Currently a **Thesis Worker at UBICOMP** specializing in **Agentic AI** and multi-agent orchestration. I offer a strong blend of innovative research and practical engineering, with a track record of deploying production-grade SaaS platforms and scalable distributed systems. Recipient of the **"Best Bachelor's Project" (Top 1%)** award, I am seeking a high-impact internship or long-term position at a prestigious firm to solve complex technical challenges.

Education

University of Oulu

2024 – Present

Master of Science in Computer Science and Engineering

Oulu, Finland

– **GPA: 4.82/5** | Specialization: Applied Computing

University of Tehran

2019 – 2024

Bachelor of Science in Electrical Engineering | Minor in Computer Engineering

Tehran, Iran

– **GPA: 17.57/20 (3.76/4.0)**

– Awarded **Best Bachelor's Project** for 1% of faculty.

Technical Skills

Web & Full-Stack: Next.js 15, React, TypeScript, Node.js, FastAPI, Prisma ORM, PostgreSQL, PgBouncer, Clerk Auth, Tailwind CSS, SQL

Agentic AI & ML: Microsoft Agent Framework, AutoGen, LangGraph, PydanticAI, Prompt Engineering, Context Engineering, RAG, Hugging Face

Cloud & Systems: Kubernetes (K8s), Docker, Kafka, MinIO (Object Storage), Vector DBs (Milvus and Qdrant), Linux, OpenLit (Observability)

Developer Tools: Git, VS Code, REST APIs

Work Experience

Freelance Software Engineer

Jan 2025 – Present

Full-Stack Developer (Musical Institution Management System)

Oulu, Finland / Remote

- Architected and deployed a dual-service ecosystem for a musical institution, comprising a private **Management ERP** and a public-facing **Landing Website**.
- Built the management core using **Next.js 15 (App Router)** and **Prisma ORM**, implementing complex relational models in **PostgreSQL** for student enrollment, scheduling, and billing.
- Developed a **Public REST API** to bridge the management backend with the landing site, enabling real-time data fetching for public course listings and faculty bios.
- Designed the landing website with a focus on SEO and performance, utilizing **Server-Side Rendering (SSR)** to display dynamic content fetched securely from the management service.
- Optimized database performance and connection resilience by implementing **PgBouncer** for connection pooling, ensuring stable throughput during peak administrative usage.

University of Oulu, UBICOMP

Nov 2025 – Present

Master's Thesis Worker

Oulu, Finland

- Architected a **Multi-Agent System** using the **Microsoft Agent Framework**, featuring a specialized Planner, Search Agent, and Summarizer for automated research workflows.
- Evaluated the production-readiness of **LangGraph**, **CrewAI**, and **PydanticAI** against MAF, selecting the latter for its superior **Handoff Orchestration** and support for **Open Standards** like A2A and MCP.
- Built a **FastAPI** backend with **asynchronous streaming** support, utilizing an AG-UI adapter for seamless frontend integration.
- Integrated **OpenLit** for system-wide observability, implementing custom spans to trace LLM latency, token usage, and tool-call execution paths.
- Engineered a secure **Python Execution Tooling** environment for real-time data analysis, supported by a library of pre-defined scripts for complex analytical tasks.

- Engineered a multi-stage NLP pipeline to extract and process STP data from document databases, utilizing **Unstructured.io** for PDF extraction and chunking.
- Deployed a researcher-facing dashboard using **Streamlit** on **CSC Virtual Machines** and built a **React**-based chatbot for live demonstrations.
- Implemented an automated classification and justification system using **Hugging Face Transformers** to generate factor-based reasoning via LLMs.
- Developed a **FastAPI** backend integrated with **Milvus Vector Database** to support a high-performance RAG (Retrieval-Augmented Generation) system.

Notable Projects

Self-Hosted AI & PaaS Infrastructure | *Dokploy, Cloudflare Tunnels, Agent Zero, Ironclaw*

- Architected a secure, self-hosted Platform-as-a-Service (PaaS) utilizing **Dokploy** and **Docker Compose** to provision and orchestrate local microservices.
- Deployed and evaluated cutting-edge open-source AI agent frameworks (**Agent Zero, Ironclaw**) within the PaaS environment, testing local multi-agent orchestration and secure, sandboxed LLM tool execution.
- Secured public ingress via **Cloudflare Zero Trust Tunnels** to bypass NAT constraints, and implemented edge-based observability using **Uptimeflare** for continuous SLA monitoring.

Distributed SCADA System | *Apache Kafka, MQTT, Kubernetes, Docker, Python*

- Architected a resilient, message-driven microservices pipeline utilizing **MQTT** for edge sensor ingestion and **Apache Kafka** for asynchronous, high-throughput data delivery.
- Containerized all microservices utilizing **Docker** and orchestrated the deployment on a **Kubernetes (K8s)** cluster to ensure high availability, resource isolation, and self-healing workloads.

AI-Integrated 3D T-Shirt Customizer | *React, Three.js, React Three Fiber, Hugging Face API*

- Created a high-performance 3D web application allowing real-time texture mapping and mesh color manipulation via **Three.js** and **React Three Fiber**.
- Integrated **Stable Diffusion (via Hugging Face API)** to enable users to generate and apply AI-driven logos directly to 3D assets through text prompts.

Crowdsourced Local Insights RESTful API | *Python, Flask, SQLAlchemy, PostgreSQL, JSON Schema*

- Architected a scalable RESTful API to manage geospatial "insights," enabling users to crowdsource and verify localized data (e.g., city issues, health reports, or experience sharing).
- Implemented complex relational data models using **SQLAlchemy ORM**, managing entities for Users, Insights, Feedback, and Notifications with cross-resource integrity.

Languages

English: Full Professional (TOEFL iBT: 101) | **Finnish:** Beginner (Level A1.3) | **Persian:** Native