

# Mohammad Sadegh Gholizadeh

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## Research & Work Experience

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### Scientific Researcher Intern

Google DeepMind

Remote – United States

June 2025 – August 2025

- Engineered the **Speech-to-Retrieval (S2R)** engine, a novel dual-encoder architecture that directly maps spoken queries to retrieval intent, **bypassing ASR** to solve cascade modeling error propagation.
- Achieved S2R performance that **approached the theoretical upper-bound MRR**, demonstrating significant gains over the baseline Cascade ASR model across multiple languages.
- Contributed to the system's live deployment across Google Search and prepared the **Simple Voice Questions (SVQ) dataset** for open-source release.

### Research Assistant

University of South Carolina, Advised by Prof. Pooyan Jamshidi

Remote

May 2024 – Present

- Working on Subliminal Learning and Steering for AI Safety Concerns
- Developed symbolic math reasoning systems using transformers and sequence-to-sequence models for integration and ODE problems.
- Worked on large-scale data generation pipelines and notation parsers for training LLMs in mathematical environments.

### Undergraduate Research Collaborator

University of Waterloo, Advised by Prof. Yuntian Deng

Remote

January 2024 – May 2024

- Trained LLMs with implicit chain-of-thought reasoning via knowledge distillation from intermediate states.
- Implemented dual-multiplication task models with internalized reasoning traces to minimize token length without sacrificing accuracy.

### Research Assistant

Shahid Rajaee University, Advised by Prof. Hamidreza Shayegh & Prof. Ehsan Pazouki

Tehran

2021 – 2023

- Reliable Detection of Minute Targets in High-Resolution Aerial Imagery across Temporal Shifts
- Robust Multi-Disease Retinal Classification via Xception-Based Transfer Learning and W-Net Vessel Segmentation

### AI/Software Engineer

Allora Labs

Remote

2023

- Developed an event-driven system using **Kafka**, **MLflow**, **Airflow**, and **Kubernetes** to enable users to deploy custom machine learning models for real-time tagging of millions of data points per minute.
- Developed **MLOps** pipelines and systems for predicting customer behavior and topic modeling.
- Developed AI chatbots and **Agentic LLM** workflows integrated with RAG at enterprise scale, handling over 1,000 queries per hour.
- Designed and developed an **Automatic Speech Recognition (ASR)** system architecture, along with data extraction and customer behavior dashboards to drive data-informed executive decisions.

## Education

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### Amirkabir University of Technology - Tehran Polytechnic

MS in Computer Science

September 2024 - Present

### Shahid Rajaee Teacher Training University

BS in Computer Engineering, Minor in Educational Psychology

February 2019 - February

2024

### National Organization for Development of Exceptional Talents (Sampad)

2015 - 2018

## Skills, Activities & Interests

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**Languages:** Python (Expert), C/C++, Go

**AI/ML Frameworks:** PyTorch, JAX, HuggingFace, Claude Code, Codex, LangChain, Claude SDK, CUDA

**Tools & MLOps:** Docker, Kubernetes (K8s), Git, CI/CD, Apache Kafka, Google Cloud Platform (GCP), AWS, Sparks, Elasticsearch, Logstash

**Databases & Backend:** Elastic Vector database, Chromodb, PostgreSQL, Redis, FastAPI, MongoDB, Django

**Concepts & Architectures:** Agentic AI, Generative AI, RAG Systems, LLMs (APIs & Fine-tuning), CoT Reasoning, MLOps, Observability, ASR, Knowledge Distillation, Adversarial ML

## Teaching & Mentoring Experience

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- Head Teaching Assistant, Co-Instructor. **Sharif University of Technology**. CE 40153: *Fundamentals of Programming*
- Teaching Assistant. **Sharif University of Technology**. CE 40254: *Data Structures and Algorithms*
- Head Teaching Assistant, Co-Instructor. **Shahid Rajaee University**. CE 224E: *Database Systems Concepts*
  - Co-designed curriculum, wrote and taught lectures, managed team of 5-6 TAs.
  - Awarded for being in the top 5% of TAs in Department of Computer Engineering.
- Teaching Assistant. **Shahid Rajaee University**. CE 209N: *Microprocessor and Assembly Language*
- Teaching Assistant. **Shahid Rajaee University**. CE 252N: *Automata Theories*
- Teaching Assistant. **Shahid Rajaee University**. CS 121: *Artificial Intelligence Fundamentals & Applications*
- Volunteer Instructor. **National Organization for Development of Exceptional Talents**. *Math & Informatic Olympiad*
  - Taught 2 courses and additional lectures on mathematics and algorithms for national Olympiads.

### Students Mentored:

Mohammad Yasin Karami. BS. Topic: *Understanding LLMs*

## Awards & Honors

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- **Computer Engineering Department Dean's List**
  - In all Semesters, except Fall 2021
- **Member of Iran's National Elite Foundation**
- **Ranked 636th Among More Than 144,000 Students**
  - in the Math & Physics group of Nationwide University Entrance Exam
- **Fully Funded Scholarship**
  - from Shahid Rajaee University
- **Accepted Qualification (Pre-Medal) Stage of Informatic Olympiad in Iran (2017)**