

# MILAD MOHAMMADI

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## Research Interests

**Keywords:** Language Agents; Large Language Models (LLMs); Multimodal Agents; Information Retrieval (IR); Digital Mental Health; Modeling Human Behavior using LLMs; Machine Psychology; LLMs Safety and Alignment; Agents Interpretability and Explanations; Human-Agent Interaction; Agent-based Simulation; Cultural Studies and Biases in LLMs

My work sits at the intersection of language agents and psychology: (1) building clinically responsible mental-health assistants and multi-agent systems such as diagnostic or therapeutic assistants—with a focus on modeling human psychological traits, and (2) applying psychological and cognitive theory to analyze and improve agent behavior, safety, and human-AI interaction.

## Education

**University of Tehran**

Sep. 2023 – present

M.Sc. in IT Engineering – GPA: 19.14/20

- **Thesis:** *Design and Implementation of an Intelligent Assistant for Clinical Assessment and Diagnosis of Mental Disorders Using Large Language Models*

**University of Isfahan**

Sep. 2018 – Jul. 2023

B.Sc. in Computer Engineering (IT Major) – Major GPA: 15.72/20

- **Final Project:** *Design and Development of a Structured Feedback Collection and Evaluation System for University Teaching and Research Assistants to Enhance Instructional and Research Support Quality*

## Publications

**SchemaGraphSQL:** Efficient Schema Linking with Pathfinding Graph Algorithms for Text-to-SQL on Large-Scale Databases, *Under review at EMNLP 2025*

Safdarian, A., **Mohammadi, M.**, Jahanbakhsh, E., Naderi, M. S., & Faili, H.

**PerMedCQA:** Benchmarking Large Language Models on Medical Consumer Question Answering in Persian Language, *Under review at EMNLP 2025*

Jamali, N., **Mohammadi, M.**, Baledi, D., Rezvani, Z., & Faili, H.

**UT-NLP at SemEval-2025 Task 11:** Evaluating Zero-Shot Capability of GPT-4o mini on Emotion Recognition via Role-Play and Contrastive Judging, *SemEval 2025*

**Mohammadi, M.\***, Safdarian, A.\*, & Faili, H. (\*Equal Contribution)

## Research Experience

**NLP Lab, University of Tehran, Graduate Researcher (M.Sc.)**

Jan. 2024 – present

↪ [Advisor Prof. Hesham Faili](#)

- Contributed regularly to weekly lab research meetings (discussion, paper critique, project planning) and collaborative development led by the supervisor.
- Led language-agent projects on agent architecture, tool integration, and planning; mentored incoming lab M.Sc. students to scope research problems in language agents.

**Computational Cognitive Psychology Lab, University of Tehran, Graduate Researcher (M.Sc.)**

↪ [Advisor Prof. Hadi Moradi](#)

Jan. 2024 – present

- Initiated a lab track on LLMs for psychological applications—especially agentic modeling of mental states—complementing prior EEG and classical ML lines.

## Work (Industry) Experience

**Adan AI AI Software Engineer (Part-time)**

Aug. 2024 – Aug. 2025

- Led architecture and delivery of an agentic customer-service chatbot for a national bank: translated PM requirements into user stories; designed a ReAct/Reflexion workflow with >15 tool steps; implemented/reviewed LangGraph+OpenAI modules; defined and tracked evaluation metrics for production.
- Built an end-to-end PDF→chunking pipeline for Persian documents (table/chart-aware parsing, entity extraction); reduced processing cost by 50% and improved retrieval accuracy by 8% (measured on human annotated RAG eval set).
- Created an automatic FAQ-bot generator: ingests Excel FAQs, cleans, synthesizes data from seed, and deploys a ready-to-use chatbot—cutting onboarding from days to <1 hour with no manual coding.
- Engineered reusable agent-infrastructure modules (session-level user-token mgmt, conversation summarization, entity/metadata enrichment) adopted across LangGraph projects, eliminating duplicate code and accelerating new-bot delivery.
- Proposed and independently deployed *LangFuse* for observability in production—instrumented agent runs with tracing, latency/error monitoring, and evaluation dashboards—standardizing debugging and speeding iteration across teams.

**Tizfekri Product Manager (Part-time)**

Mar. 2023 – Sep. 2023

- Led product discovery and requirements analysis for a new LMS focused on teaching thinking skills (critical thinking, academic writing); translated pedagogical goals into user stories, specifications, and an MVP roadmap.

Teaching Experience

- Large Language Models

Graduate Teaching Assistant

Feb. 2025 – Jul. 2025

↪ Dr. Yadollah Yaghoobzadeh; Dr. Mohammad Javad Dousti

ECE @ University of Tehran

- Designed a multi-stage course assignment on *language agents*: from prompt-router baselines to ReAct-style agents solving text-to-SQL on the BIRD dataset; authored rubric and graded the assignment, midterm, and final. [GitHub]
  - Led a hands-on workshop on building agents with *LangGraph*; recording available in Persian on YouTube. [YouTube]
- Artificial Intelligence & Digital Transformation

Workshop Instructor

Feb. 2025 – Jul. 2025

↪ Prof. Majid Nili Ahmadabadi

University of Tehran

- Delivered two large-venue lectures (500+ students) in the course’s inaugural *university-wide* offering open to all fields—covering prompting, Language-Agent concepts, and building simple workflow agents in *n8n*, tailored for non-engineering cohorts.
- Natural Language Processing

Graduate Teaching Assistant

Sep. 2024 – Jan. 2025

↪ Prof. Hesham Faili

ECE @ University of Tehran

- Authored the final project *ChatFood*: an agentic food-ordering chatbot with RAG over a “food book,” tool use for order/track/cancel, and a Reflexion-based recommender; provided runnable backend and DB starter code. [GitHub]
  - Ran a 4-hour workshop on chatbots & agents with *LangGraph*, *LanceDB*, and *Chainlit* covering design patterns and evaluation. [YouTube]
- Intelligent Information Retrieval

Graduate Teaching Assistant

Sep. 2024 – Jan. 2025

↪ Dr. Azadeh Shakeri

ECE @ University of Tehran

- Designed *NanoSparseRetriever*: a from-scratch Python assignment covering indexing, query/document processing, and pluggable scoring—students implemented TF-IDF/BM25 and probed parameter effects. [GitHub]
  - Taught a project workshop on *OpenAI API* and RAG pipelines using *LanceDB* and open-source dense retrievers. [YouTube]
- Deep Learning & Neural Networks

Graduate Teaching Assistant

Sep. 2024 – Jan. 2025

↪ Dr. Ahmad Kalhor

ECE @ University of Tehran

- Designed the course project on LLM fine-tuning: *Gemma 2* for Persian chat via Prefix-Tuning, LoRA, and QLoRA; delivered a workshop on LLM architecture and fine-tuning with *Hugging Face Transformers*.
- Digital Transformation

Course Assistant

Jul. 2021 – Sep. 2021

↪ Dr. Fakhroddin Noorbehbahani

INSA Lyon × University of Isfahan

- Supported workshops and 1:1 technical sessions; coordinated with instructors across institutions.
- Undergraduate Computer Engineering Courses

TA at University of Isfahan

2019–2023

- Algorithm Design; Discrete Mathematics; Programming Foundations; IT Foundation; E-Commerce

Technical Skills

Software Engineering	Python; FastAPI; Pydantic; SQLite; pytest
LLMs Agents	LangGraph; OpenAI SDK; LangFuse; n8n; Chainlit
Retrieval	LanceDB; Qdrant; Elasticsearch; evaluation (RAGAS)
Deep Learning	PyTorch; Hugging Face (Transformers, Datasets, PEFT)
Machine Learning	NumPy; Pandas; scikit-learn; Matplotlib; NLTK
Tools & DevOps	Docker; Docker Compose; Git/GitHub; uv

Awards

- Ranked 1st nationwide in IT Engineering, Graduate Entrance Exam (Konkur) 2023
- Iran national graduate admissions exam
- Youth Award, TEDxKish 2015
- Outstanding young innovator

Selected Projects

- Text-to-Insight Data Analyst Agent (Text2SQL & Data Visualization)

LLMs course final project; Team of 3

[GitHub]

End-to-end agent converting natural-language questions into SQL over a curated SQLite DB (from the BIRD dataset), then auto-generating Python analysis code for tables/plots and a written report; included an LLM-as-judge framework to evaluate component quality and end-to-end answers (report accuracy and SQL exact-match).
- MedYar: Health Reservation Agent (Triage & Booking)

48-hour hackathon; Team of 3

[GitHub]

Doctor-visit assistant performing symptom intake and specialty routing, collecting user preferences (e.g., physician/time), checking availability, and booking on *Paziresh24*; implemented as a ReAct-style tool-use agent with web automation for a full booking flow (demo end-to-end success rate reported).

Volunteering Experience

- Algorithmic Creativity & Python Programming Course

Core Organizing Team & Mentor

Jun. 2023 – Sep. 2023

Core organizer and mentor for a 10-week nationwide course instructed by Dr. Ali Sharifi-Zarchi, supporting 4,500+ high school students with a 110-member team and coordinating content/mentoring across sections.
- ACM Student Chapter, University of Isfahan

Committee Member

Oct. 2019 – Dec. 2022

Organized programming contests and taught algorithm design; participated in weekly ICPC trainings.
- TEDxUniversityOfIsfahan

Team Lead & Organizer

Feb. 2015 – Dec. 2020

Founded *TEDxUniversityOfIsfahan* (2019) and led end-to-end (planning, budgeting, sponsorship, marketing, speaker coaching); the series now runs annually via the student community, with talks reaching thousands of views.