Mohammad (Mahdi) Abootorabi

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For comprehensive insights into each section, kindly refer to my Homepage.

Education

The University of British Columbia — *Vancouver, Canada*
MASTER OF APPLIED SCIENCE IN ELECTRICAL AND COMPUTER ENGINEERING — *Sep. 2025 - Aug. 2027 (expected)*
- Under the supervision of **Professor Purang Abolmaesumi**
- **Notable Courses**: Machine Teaching, Adaptation & Adaptive Computation, Interpretability and Explainability

Sharif University of Technology (SUT) — *Tehran, Iran*
BACHELOR OF SCIENCE IN COMPUTER ENGINEERING — *Sep. 2019 - Feb. 2024*
- Overall **GPA**: 3.93/4.00 (Average: **19.38/20**) , Major **GPA**: 3.97/4.00 (Average: **19.73/20**)
- **Notable Courses**: Natural Language Processing, Machine Learning, Artificial Intelligence, Linear Algebra, Modern Information Retrieval

Research Interests

- Multimodal Learning, Natural Language Processing (NLP), Representation Learning, Information Retrieval, AI for Healthcare

Publications

- O. Ghahroodi[*], **M. M. Abootorabi[*]**, M. Nouri, D. Dastgheib, and E. Asgari. BloomBench: A Bilingual Multimodal Benchmark for Cognitively Informed Evaluation of Vision-Language Models. **Submitted to EACL 2026.** Preprint
- **M. M. Abootorabi**, A. Zobeiri, M. Dehghani, M. Mohammadkhani, B. Mohammadi, O. Ghahroodi, M. S. Baghshah, and E. Asgari. Ask in Any Modality: A Comprehensive Survey on Multimodal Retrieval-Augmented Generation. **ACL 2025 Findings**, July 2025. **27 Citations and 377 GitHub Stars.** ACL Anthology Github Website
- **M. M. Abootorabi** and E. Asgari. CLASP: Contrastive Language-Speech Pretraining for Multilingual Multimodal Information Retrieval. **ECIR 2025**, April 2025. arXiv ACM Digital Library Website Models Newly Introduced Dataset Code
- **M. M. Abootorabi**, O. Ghahroodi, P. S. Zahraei, H. Behzadasl, A. Mirrokni, M. Salimipanah, A. Rasouli, B. Behzadipour, S. Azarnoush, B. Maleki, E. Sadraiye, K. K. Feriz, M. T. Nahad, A. Moghadasi, A. E. Abianeh, N. Nazar, H. R. Rabiee, M. S. Baghshah, M. Ahmadi, and E. Asgari. Generative AI for Character Animation: A Comprehensive Survey of Techniques, Applications, and Future Directions. May 2025. arXiv Github Website
- **M. M. Abootorabi[*]**, A. Ghahramani[*], M. Mohammadkhani, S. Elahimanesh, and M. A. Ali Panah. MultiMind at SemEval-2025 Task 7: Crosslingual Fact-Checked Claim Retrieval via Multi-Source Alignment. **SemEval at ACL 2025**, July 2025. ACL Anthology
- **M. M. Abootorabi**, N. Ghazizadeh, A. Dalili, A. Ghahramani, M. Dehghani, and E. Asgari. AIMA at SemEval-2024 Task 10: History-Based Emotion Recognition in Hindi-English Code-Mixed Conversations. **SemEval at ACL 2025**, June 2024. ACL Anthology
- A. Ghahramani, M. Dehghani, **M. M. Abootorabi**, N. Ghazizadeh, A. Dalili, and E. Asgari. AIMA at SemEval-2024 Task 3: Simple Yet Powerful Emotion Cause Pair Analysis. **SemEval-NAACL-2024**, June 2024. ACL Anthology

Skills

Programming Languages	**Python**, **Java**, C, C++, Android, HTML, JavaScript
Libraries	**NumPy**, **PyTorch**, **Transformers**, **Scikit-Learn**, **W&B**, PyTorch Lightning, NLTK, SciPy, Pandas
Frameworks	**Django**, **Django REST**
Databases	**PostgreSQL**, **Redis**, MongoDB
Operating Systems	**Linux (Ubuntu)**, Microsoft Windows, macOS, WSL
Other Technologies	**Git**, **Celery**, RabbitMQ, Jupyter Notebook, LaTeX, Docker, Trello, Notion, Prompt Engineering
Soft Skills	**Teamwork**, **Self-Learning**, **Leadership**, Problem Solving, Creativity, Flexibility, Mentorship, Willingness to Learn

Professional Experience

The University of British Columbia — *Sep. 2025 – Present*
RESEARCH ASSISTANT — *Supervisor: Prof. Purang Abolmaesumi*
- Developing novel **multimodal learning** methods to improve prostate cancer detection using histopathology and ultrasound images.

Saarland University — *June. 2025 – Sep. 2025*
RESEARCH ASSISTANT — *Supervisor: Prof. Vera Demberg*
- Designing **contrastive learning-based methods** to enhance **semantic gesture understanding and representation** from video, with a publication in preparation.

Qatar Computing Research Institute (QCRI) — *July. 2024 – Sep. 2025*
REMOTE RESEARCH ASSISTANT (VOLUNTARY, UNPAID) — *Supervisor: Dr. Ehsaneddin Asgari*
- Author surveys on **multimodal RAG** and generative AI for animated characters, highlighting gaps and future directions.
- Advance Arabic vision-language models beyond state-of-the-art and **introduce a benchmark** for practical VLM evaluation.

Imperial College London — *Sep. 2024 – Sep. 2025*
REMOTE RESEARCH ASSISTANT (VOLUNTARY, UNPAID) — *Supervisor: Prof. Abbas Edalat*
- Design an **LLM-based Persian therapist Agent** incorporating the Self-Attachment Technique (SAT), achieving superior performance over baseline LLMs.

Sharif University of Technology — *Jan. 2023 – Feb. 2024*
RESEARCH ASSISTANT (VOLUNTARY, UNPAID) — *Supervisor: Dr. Ehsaneddin Asgari*
- Design a novel **multimodal contrastive learning**-based semantic speech encoder that outperforms ASR-based retrieval pipelines in speed, accuracy (many scenarios), and efficiency.

University of New South Wales — *June. 2023 – Sep. 2023*
REMOTE RESEARCH ASSISTANT (VOLUNTARY, UNPAID, SUMMER INTERNSHIP) — *Supervisor: Dr. Imran Razzak*
- Design an **RL-based model** to automate and enhance medical report generation for Fundus Fluorescein Angiography images.

Yektanet Technology Company   *Oct. 2020 - Oct. 2021*
SOFTWARE ENGINEER
- Develop **innovative algorithms** that improve user attraction to online ads, driving higher income.
- Develop **an ATS system** from scratch to automate tasks such as scheduling meetings and writing Trello comments, streamlining the HR process.
- Implement features in a large-scale service and **mentor fresh software engineers** to support their professional growth.
- Handle site reliability engineering tasks, including **server maintenance** and performance monitoring.
- **Design efficient data storage methods** and work with databases and architectures such as Redis master-slave to manage high request volumes.

Remarkable Academic Projects

Autonomous Vision-Powered Travel Agent   *Source Code*   *Spring 2025*
- Developed an autonomous travel-planning agent that processes natural language queries and navigates booking websites **without relying on HTML.**
- Leveraged **multimodal integration** of Computer Vision and LLMs to interpret screenshots and present flight options via an interactive front-end.

RAG-based Educational Assistant Chatbot   *Source Code*   *Winter 2025*
- Built an **end-to-end educational chatbot** using a RAG architecture to deliver reliable, country-specific student guidance.
- Integrated Vue, Node.js, and FastAPI with **Sentence Transformers and LLMs** to ground responses in verified documents; deployed live for personalized advice based on user context.

Health Retrieval Search Engine   *Source Code*   *Spring 2022*
- Designed an **advanced search engine** for **efficient retrieval** and organization of health-related content.
- Implemented TF-IDF, FastText, Elasticsearch, and Transformer models using modern techniques with a deployable user-friendly interface.

Bias detection & De-biasing in Language Models   *Source Code*   *Winter 2022*
- Detected and **mitigated gender and ethnic biases** in multilingual language models, including low-resource languages.
- Developed **de-biasing techniques** specifically tailored for **Persian language models.**

Personal Information Hider   *Source Code*   *Spring 2022*
- Developed a Python package to **enhance privacy** by concealing personal information in text files using POS tagging and regex-based methods.

News Classification, Summarization, & Question Answering System   *Source Code*   *Spring 2023*
- Built a comprehensive system for Persian news analysis, including classification, question-answering, and summarization using **transformer models.**

Resume Parser   *Source Code*   *Winter 2022*
- Created a Python package for **automated resume parsing**, extracting structured information from Persian CVs to support Applicant Tracking Systems.

Memo Reminder Application   *Source Code*   *Spring 2021*
- Developed Memo Reminder, a cross-platform mobile app (iOS/Android) for sharing and reliving memorable moments, such as instagram.

Honors & Awards

2025   **Selected for the Konrad Zuse School (ELIZA) Scholarship**, to join a graduate school of excellence connecting German units of the European ELLIS network and Germany's leading experts in machine learning-driven AI.   *Germany*

2024   **Ranked in the top 9%**, of Computer Engineering students based on GPA at Sharif University of Technology. (**16** out of 190)   *Iran*

2019   **Ranked 10th**, among nearly 165,000 participants in the nationwide university entrance exam (Konkour) in the Mathematics Branch, securing a fully funded B.Sc. (tuition fee waiver) period in Iran.   *Iran*

2013   **Admitted to Allameh Helli Middle School**, among nearly 80,000 students under the supervision of the National Organization for Developing Exceptional Talents (NODET).   *Iran*

Selected Teaching Assistant Experience

Compiler Design ($\times 5$)   *Spring 2024, Fall 2023, Spring 2023, Fall 2022, Spring 2022*
HEAD TEACHING ASSISTANT   *Sharif University of Technology*
- **Leading & Organizing Other Assistants**, Correcting Mid-term & Final Exams, **Designing & Grading Assignments**.

Artificial Intelligence ($\times 3$)   *Fall 2023, Spring 2023, Spring 2022*
TEACHING ASSISTANT   *Sharif University of Technology*
- Designing & Grading Assignments, **Designing Questions for Mid-terms**.

Modern Information Retrieval ($\times 3$)   *Spring 2023, Fall 2022*
TEACHING ASSISTANT   *Sharif University of Technology*
- Designing & Grading Assignments, Designing & Grading a Quiz.

Linear Algebra ($\times 3$)   *Spring 2023, Fall 2022, Spring 2022*
TEACHING ASSISTANT   *Sharif University of Technology*
- Designing & Grading Assignments, Designing & Grading a Practical Project, **Designing & Revising Lecture Slides**.

Academic Service & Volunteer Activities

Volunteer Staff at ACL 2025 Conference   *Summer 2025*
- Assisted in organizing the conference by coordinating presentations and poster sessions, and supporting attendee registration.

Technical Content Creation   *Fall 2022 – Spring 2023*
- Expanded Persian Wikipedia's Machine Learning resources by creating a page on **Knowledge Distillation** (link) and significantly enhancing the page on **Autoencoders** (link), making advanced ML concepts more accessible to Persian readers.
- Authored educational content on **Test-driven Development** by creating posts for the Persian Medium and enhancing its Persian Wikipedia page.

Presentation & Workshop Hosting   *Summer 2021*
- Conducted a presentation and workshop on **Django and the REST architectural style** for students at **Sharif University**. This session provided insights into the responsibilities of software engineers and **back-end developers** and offered an introduction to the basic concepts of Django.

ICPC Staff Member   *Spring 2020*
- Served as a **staff member** in preparing for the International Collegiate Programming Contest (ICPC), contributing to the execution of the event.