

Abtin Badie

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Education

Iran University of Science and Technology (IUST)

B.Sc. Computer Engineering

- GPA: 18.87/20 – (3.99/4)

2021 – Present

Expected Graduation: Fall 2025

Research Interest

- » Deep Learning
- » Machine Learning
- » Computer Vision
- » NLP (Natural Language Processing)
- » LLM (Large Language Models)

Honors and Awards

- » Top 10% Undergraduate Student, Iran University of Science and Technology (Present).
- » Ranked 2nd among first-year cohorts at Iran University of Science and Technology (2022).
- » Ranked 1st for academic achievement at [Tohid High School](#) (2019, 2021) and [Ehsan School](#) (2018).

Experience

Undergraduate Research Assistant

IUST Natural Language Processing Lab

June 2024 – Present

Tehran, Iran

- Conducting thesis research on Medical Image Captioning to generate automated medical reports from images.
- Investigating methods to enhance LLM performance in specialized domains under Dr. Sauleh Etemadi's supervision.
- Designed and built an autonomous agent system using LLMs for complex task execution.

Teaching Assistant

Iran University of Science and Technology

Tehran, Iran

- Served as **Head TA** for *Theory of Languages and Automata*, supporting 100+ students by leading recitations, grading, and holding office hours.
- Also assisted with courses including: *Artificial Intelligence*, *Advanced Programming*, *Fundamentals of Programming*, *Digital Systems Design*, *Logic Circuits*, and *Discrete Mathematics*.

Software Engineer Intern

TAPSI

Feb 2025 – Jun 2025

Tehran, Iran

- Developed the Minimum Viable Product (MVP) for TAPSI-Service, a new platform for on-demand home repair and utility services.
- Built a scalable back-end architecture as a member of the system design team using **Python**, **FastAPI**, and **PostgreSQL**.

Projects

IdeYar: Crowdfunding Platform Front-End | [React](#), [Front-End Development](#), [System Design](#), [UI/UX](#)

- Led the front-end development and system design for a Kickstarter-inspired web platform, enabling users to create, discover, and fund creative projects.
- Architected a scalable and maintainable front-end using React, designing a component-based structure, state management strategy, and RESTful API integration.
- Developed key user-facing features, including dynamic project pages, user authentication, profile dashboards, and a streamlined campaign creation process.

Medical Image Captioning with BLIP & Flan-T5 | [Image Captioning](#), [PyTorch](#), [Hugging Face](#), [BLIP](#), [Flan-T5](#)

- Engineered a two-stage captioning pipeline using BLIP for initial generation and Flan-T5 for refinement, enhancing caption descriptiveness for radiology images.

- Fine-tuned the BLIP model on the ROCoV2 dataset to adapt its vision-language understanding to the specialized medical imaging domain.
- Developed an automated evaluation framework using BERTScore and ROUGE-L to rigorously measure the semantic similarity and accuracy of generated captions.

Persian Video Understanding: Fine-Tuning CLIP & CLIP4Clip | Multimodal Learning, PyTorch, Video-Text Retrieval

- Adapted CLIP and CLIP4Clip models for Persian by fine-tuning on the MSR-VTT dataset with 10,000 translated captions, enabling bilingual video-text retrieval.
- Implemented multilingual text encoders with custom tokenization and efficient training on an NVIDIA V100 GPU using weighted contrastive loss and dynamic frame sampling for temporal awareness.
- Achieved 84.1% R@1 accuracy in Persian text-to-video retrieval, outperforming zero-shot baselines, and developed a reusable GitHub framework for multimodal research.

Deep Learning Course Workshops | PyTorch, Generative Models, PEFT, CNNs, Transformers

- Established a comprehensive workshop series covering fundamentals like NumPy, Pandas, and PyTorch, emphasizing GPU-accelerated tensor operations.
- Built a diverse range of models from scratch, including CNNs for image classification, RNNs for NLP, LSTMs for time-series forecasting, and generative models like VAEs and Conditional GANs.
- Implemented advanced, parameter-efficient fine-tuning (PEFT) techniques, including building a Transformer from the ground up and using LoRA to adapt a Stable Diffusion model for medical imaging.

Artificial Intelligence Course Projects | Python, TensorFlow, Keras, Reinforcement Learning

- Implemented classical ML algorithms from scratch, including [Decision Trees](#) for fraud detection, [SVMs](#) for text classification, and a [Genetic Algorithm](#) for clustering.
- Built and trained [MLP neural networks](#) using TensorFlow and Keras for function approximation and CIFAR-10 image classification, including full hyperparameter tuning.
- Engineered [deep reinforcement learning agents](#) for pendulum balancing (95% success rate) and Othello (82% win rate) using trial-and-error and self-play techniques.

Selected Courses

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|---|---|
| » Artificial Intelligence (20/20) | » Theory of Languages & Automata (20/20) |
| » Computational Intelligence (18.75/20) | » Data Structures (18.37/20) |
| » Fundamentals of Programming (20/20) | » Analysis & Design of Algorithms (18.5/20) |
| » Advanced Programming (20/20) | » Operating Systems (18.3/20) |

Test scores

- » Scheduled to take the TOEFL exam on October 29, 2025.

Skills

AI & Machine Learning

- **Frameworks/Libraries:** TensorFlow, PyTorch, Keras, LangChain, Scikit-learn, NumPy, Pandas
- **Core Concepts:** Deep Learning (CNNs, RNNs, Transformers), LLMs, Natural Language Processing (NLP), Computer Vision

Web Development & Programming

- **Languages:** Python, JavaScript, TypeScript, Go, SQL, C/C++, MATLAB
- **Backend:** FastAPI, Django, Fiber (Go), GORM
- **Frontend:** React, HTML5, CSS3
- **Databases:** PostgreSQL, MySQL

DevOps, Tools & Professional

- **Tools & Platforms:** Git, Docker, Linux, Bash, CI/CD
- **Mobile Development:** Android, Kotlin
- **Professional Skills:** Teamwork, Team Leadership

Certificates

- [Algorithmic Toolbox](#): Coursera
- [Data Structures](#): Coursera
- [Advanced Algorithms & Data Structures](#): Quera
- [Machine Learning with Python](#): Quera
- [Backend Development with Django](#): Quera
- [Frontend Development with React](#): Quera
- [Software Engineering with Golang](#): Quera

References

Dr. Sauleh Etemadi	Assistant Professor at Iran University of Science & Technology sauleh@iust.ac.ir
Dr. Nasser Mozayani	Associate Professor at Iran University of Science & Technology mozayani@iust.ac.ir
Dr. Reza Entezari Maleki	Assistant Professor at Iran University of Science & Technology entezari@iust.ac.ir
Dr. Farzaneh Ghayour Baghbani	Assistant Professor at Iran University of Science & Technology farzane.ghayour@gmail.com