Ali Ahmadi Esfidi

AI Researcher & Web/Software Developer

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About

Final-year **B.Sc. Computer Science student** at **Amirkabir University of Technology**, with experience as an **AI researcher and developer** focused on **deep reinforcement learning** and **machine learning** for real-world decision-making systems. Experienced in applied projects across **infrastructure monitoring**, **agriculture**, and **computational biology**. Skilled in developing practical, data-driven AI solutions from modeling to deployment, with a strong background in **software** and **web development** that supports end-to-end system building.

Education

B.Sc. Computer Science › Amirkabir University of Technology — Sep 2022 – Present
- Location: Tehran, Iran | Field of study: Computer Science | GPA: 18.81/20 | Top 20%

High School Diploma › Dr. Shahriari High School (SAMPAD) — Sep 2019 – Jun 2022
- Location: Qom, Iran | Field of study: Mathematics & Physics | GPA: 18.42/20

Experience

Research Assistant › Supervisor: Prof. Ghatee — Jan 2025 – Present
NORC Lab, Amirkabir University of Technology

- **Web Developer** and **AI Team Lead**, developing web systems and deep learning models for automated bridge damage detection with the **Tehran Urban Planning and Research Center**.
- Contributed to the master's thesis *"Damage Detection in Bridge Structures Using Compact Machine Learning Models"* by developing efficient deep-learning methods for structural health monitoring.
- *Stack:* `PyTorch` • `OpenCV` • `ReactJS` • `NodeJS` • `PostgreSQL` • `Docker`

Research Assistant › Supervisor: Prof. Khonsari — Sep 2024 – Present
High Performance Networks Lab, Tehran University

- Collaborated on a **DRL-based agricultural irrigation optimization** project using DSSAT-generated datasets; contributed to algorithm design and core code implementation
- Co-authored a **CSICC 2025** paper and contributed to the DeepIrrigo study (to be submitted to **Smart Agricultural Technology**), including refinement of methodology and analysis.
- *Stack:* `PyTorch` • `TensorFlow` • `Pandas` • `NumPy`

Teaching Assistant › 2 Graduate and 3 Undergraduate Courses — Sep 2024 – Present
Amirkabir University of Technology & Tehran University

- **Quantum Information Processing** (Master's, Prof. Khonsari) — Sep 2025 – Jan 2026
- **Computational Data Mining** (Master's, Prof. Ghatee) — Sep 2025 – Jan 2026
- **Theory of Computation** (Dr. Didehvar) — Sep 2024 – Present
- **Introduction to Logic** (Dr. Didehvar) — Sep 2025 – Jan 2026
- **Artificial Intelligence & Workshop** (Prof. Ghatee, Dr. Yousefimehr) — Sep 2024 – Jan 2025

Publications

- **Irrigation Optimization in Agricultural Fields Using Deep Reinforcement Learning Approaches**
  P. Heidari, A. Ahmadi Esfidi, A. Mehrvarz, E. Khodaei, A. Khonsari
  CSICC 2025 DOI: `10.1109/CSICC65765.2025.10967419`
- **DeepIrrigo: Deep Reinforcement Learning for Continuous and Discrete Action Irrigation Optimization — A Case Study in Iran**
  P. Heidari, A. Khonsari, A. Ahmadi Esfidi, A. Mehrvarz, E. Khodaei
  Submitted to *Smart Agricultural Technology*
- **Rule Caching in Programmable Networks with Deep Reinforcement Learning**
  M. Saberi, A. Ahmadi Esfidi, M. Dolati, A. Movaghar, A. Khonsari
  To be submitted to *IEEE Transactions on Parallel and Distributed Systems*

Selected Projects

See more

DRL-Based Beamforming Optimization for Movable Intelligent Surfaces

Jun 2026 – Present

- Designed a DRL framework to optimize beamforming for (MIS)-assisted SWIPT systems, implementing agents that jointly configure phase shifts and power splitting ratios to maximize energy harvesting.
- *Stack:* `PyTorch` • `Gymnasium` • `MOSEK` • `PennyLane` • `NumPy`

RL-Based ML Job Scheduler with Distribution Optimization

Aug 2025 – Oct 2025

- Developed a two-stage hierarchical PPO system for scheduling ML jobs on multi-server accelerator clusters using the Gavel dataset, reducing average job completion time.
- *Stack:* `PyTorch` • `Gymnasium` • `NumPy`

Machine Learning Perspectives on Gold-Binding Peptides

May 2025 – Jun 2025

- Applied machine learning to classify and predict gold-binding affinity of peptide sequences. Compared regression and classification approaches across multiple featurization strategies for bio-nanotechnology applications.
- *Stack:* `PyTorch` • `Scikit-learn` • `Hugging Face` • `Pandas` • `NumPy/SciPy`

RNA Pairing Pattern Recognition Model

Mar 2024 – Jul 2024

- Presented a preliminary version at the CBRC Journal Club and developed a system to predict RNA secondary structures using SCFGs, evolutionary information, and enhanced CYK parsing for complex motifs.
- *Stack:* `NetworkX` • `Biopython` • `PhyML` • `NumPy/SciPy`

Technical Skills

Languages	`Python` • `JavaScript` • `TypeScript` • `R` • `Java` • `C++` • `Swift`
Frameworks	`React` • `Node.js` • `Express.js` • `Django` • `Electron`
Data Science / ML	`PyTorch` • `TensorFlow` • `Pandas` • `Scikit-learn` • `NumPy` • `OpenCV` • `LangChain`
Platforms & Tools	`Docker` • `Git` • `GitHub` • `MongoDB` • `PostgreSQL` • `Hugging Face`

Languages

Persian	Native
English	Fluent

Certifications

Bioinformatics Internship Program › Biocan — Nov 2025
Scientific Secretary: Dr. Z. Salehi • Course Director: Dr. K. Kavousi

Introduction to Bioinformatics › Biocan — Jul 2025
Scientific Chair: Dr. K. Kavousi • Score: 96/100 • Top 3% of 350+ students

Scrum Foundations Course › Ultima Training Tech — Dec 2024
Instructor: Josef Balahan

Volunteering

Student Scientific Magazine "Halghe" › Amirkabir University of Technology — Dec 2025 – Present
Contributed to scientific editing and supported the editorial team

Technical & Web Support Volunteer › AI Academic Events — May 2023, Feb 2025
Web and procurement support for DAI DAY (2025) and the International Conference on AI and Smart Vehicles (2023)