AMIRREZA VELAE

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RESEARCH INTERESTS

- Machine Learning
- Reinforcement Learning
- Optimization
- Bandit Algorithms
- Game Theory
- High Dimensional Statistics

EDUCATION

Sharif University of Technology (*Expected Graduation: Sep 2026*) — Tehran, Iran

- Bachelor of Science, **Electrical Engineering** — Sep 2021 – Present
- Minor in **Mathematics** — Jan 2023 – Present

Allameh Jafaru High School (NODET) — Marand, Iran

- Higher Secondary Education, **Math and Physics** — 2018 – 2021

RESEARCH EXPERIENCES

Sharif University of Technology (B.Sc. Thesis)

- **Optimization in Reinforcement Learning** — Oct 2024 – Present
  Supervisor: Prof. Hamed Shah-Mansouri
  - We are working on optimization in reinforcement learning in model free settings. We aim to develop a new numerical method for solving the policy gradient problem in RL.

University of Amsterdam

- **Policy Planning in Large Language Models** — July 2024 – Present
  Supervisor: Prof. Mohammad Aliannejadi
  - I am working on policy planning in large language models via context embedding and RL.
- **Backpack Model** — Aug 2024 – Present
  Supervisor: Prof. Mohammad Aliannejadi
  - This project transformed the BackPack decoder-only model into an encoder using an unsupervised approach, optimizing it for ranking and mitigating biases like gender bias through a modular architecture.

    Expected Submission: ARR Conference 15 Feb 2025

Max Planck Institute for Intelligent Systems

- **Learning-to-Defer (L2D) in Bayesian Machine Learning** — April 2024 – Sep 2024
  Supervisor: Amin Charusaie & Prof. Samira Samadi
  - In this project, I worked on Learning-to-Defer. We aimed to utilize human feedback to enhance the performance of machine learning models. We have tested L2D performance on Bayesian layers.

WORK EXPERIENCES

Tabdeal

- **LLM Researcher** — May 2024 – Present
  Tabdeal is a crypto exchange that provides a platform for more than 1 million users to trade digital currencies.
  Topic: Working on RAG for the company's chatbot and integrating it with the company's website.

SELECTED ADVANCED COURSES

- **Undergraduate Courses**: Linear Algebra - 19.8/20, Introduction to Machine Learning - 19.5/20, Signals and Systems - 19.2/20, Convex Optimization - 17/20, Game Theory - 17.8/20.
- **Graduate Courses**: Deep Learning - 17.2/20, Reinforcement Learning - 20/20, Stochastic Process†, Convex Optimization II (Currently Enrolled), Optimal Control (Currently Enrolled), High Dimensional Probability (Currently Enrolled), Numerical Methods in Optimization (Currently Enrolled), Online Learning †.
  † Audited `or` Currently Auditing

SELECTED ADVANCED COURSE PROJECTS

- Poster presentation on "Robust Reinforcement Learning" and other related projects [code and report]
- Adaptive Filter for Noise Cancellation and other Signal Processing projects [code and report]
- Implementation of GANBERT model for text classification task [code and report]
- Presentation on "BGA" on Optimization Seminar [simulations and slides]
- High Dimensional Analysis of Neural Tangent Kernel [code and report]
- Expectation Maximization for Mixture of Gaussians [code and report]
- Multiple Deep Learning projects [code]

TEACHING EXPERIENCES

Teaching Assistant, Sharif University of Technology (For more information, please visit my teaching page)

- **Undergraduate Courses**:
  - Probability and Statistics (Spring 2023 & Spring 2024 & Fall 2024)
  - Signals and Systems (Fall 2023 & Spring 2024)
  - Machine Learning (Fall 2023, Spring 2024, & Fall 2024 Head Assistant)
  - Mathematical Methods in Engineering (Linear Algebra) (Fall 2023 & Spring 2024)
  - Optimization (Fall 2024)
- **Graduate Courses**:
  - Deep Learning (Fall 2024)

VOLUNTEER EXPERIENCE

- **Scientific Associate Principal**, Student Association at Sharif University (Resana) June 2023 – July 2024
  Resana is the scientific community at the Electrical Engineering department at Sharif University of Technology.
- **Head**, Head of First AIVengers Summer School June 2023 – Sep 2023
  AIVengers is a student event in AI and ML, featuring Ph.D. students from Stanford and SUT as instructors.
- **Central Council Member**, ReACT 2024 Dec 2024
  ReACT 2024, a major Iranian conference, hosted over 1,500 attendees and featured top global researchers.

SKILLS AND INTERESTS

- **Programming**: Python (PyTorch, OpenCV, LangChain, Django, etc.), MATLAB, C++, Java, MySQL
- **Languages**: Persian, English, Turkish, Russian & Ukrainian (Elementary)

HONORS AND AWARDS

- **Ranked 51st** in the Mathematics and Physics University Entrance Exam among 165,000 participants 2021
- **Ranked in the Top 20%** among 200 students in the EE department (**3rd** among Control students) 2025