AMIRREZA VELAE

amirreza.velae@ee.sharif.edu ◇ Webpage 🌐 ◇ Gmail ◇ GitHub ◇ LinkedIn ◇ X

RESEARCH INTERESTS

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

EDUCATION

Sharif University of Technology — Tehran, Iran

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

Allameh Jafari High School (NODET) — Marand, Iran

- Higher Secondary Education in **Mathematics and Physics** — 2018 – 2021

RESEARCH EXPERIENCE

Sharif University of Technology

- **Optimization in Policy Gradient Algorithms (B.Sc. Thesis)** — Oct 2024 — Aug 2025
  Supervisor: Prof. Hamed Shah-Mansouri
  - Analyzed conjugate-gradient updates in TRPO and explained why iteration clipping stabilizes optimization and improves solution quality; reproduced baselines and ran controlled ablations.

- **Robust Reinforcement Learning** — Apr 2025 — Present
  Supervisor: Prof. Sajjad Amini
  - Lead a small research group on robust RL; conducted literature synthesis and implemented key baselines.

University of Amsterdam & Stanford University

- **Bias Mitigation in Ranking** — Aug 2024 — Present *(Remote)*
  Supervisors: Profs. Mohammad Aliannejadi & Sanjay Lall — *Target venue:* ARR Oct 2025 cycle
  - Converted the decoder-only BackPack LM into an encoder via an unsupervised objective, enabling ranking tasks and modular bias mitigation. Preprint: here.

Max Planck Institute

- **Second-order Methods for Reinforcement Learning** — Apr 2025 — Present *(Remote; visa pending)*
  Supervisors: Prof. Sadegh Soudjani and Dr. Arash Bahari Kordabad — *Target venue:* ECC 2026
  - Designed a tractable algorithm for exact and quasi second-order updates in deterministic policy-gradient methods for LQR, deriving an explicit, structured form of the second-order policy gradient.

WORK EXPERIENCES

Tabdeal

- **AI Software Engineer** — Jun 2024 – Apr 2025
  Tabdeal is a cryptocurrency exchange platform serving over 1.5 million users.
  Developed a Retrieval-Augmented Generation (RAG) chatbot and integrated it into the website.

SELECTED ADVANCED COURSES

- **Undergraduate Courses**: Linear Algebra – 19.8/20, Machine Learning – 19.5/20, Signals and Systems – 19.2/20, Convex Optimization – 17/20, Game Theory – 17.8/20, Numerical Optimization – 19/20

- **Graduate Courses**: Deep Learning – 17.2/20, Reinforcement Learning – 20/20, Stochastic Processes[†], Convex Optimization II – 18.7/20, High-Dimensional Probability Analysis – 19.3/20, Online Learning[†], Optimization Seminar – 18/20, *Information Theory, Statistics, and Learning, Graphical Models, Bandit Algorithms*[†]
[†] Audited or Self-studied   *Italicized courses indicate current enrollment or study.*

SELECTED ADVANCED COURSE PROJECTS

- Poster presentation on "Robust Reinforcement Learning" and related projects [code, report]

- Adaptive filter for noise cancellation and other signal processing projects [code,report]

- Implementation of the GANBERT model for a text classification task [code,report]

- Presentation on online geometric optimization in the bandit setting against an adaptive adversary [slides]

- High-dimensional analysis of the Neural Tangent Kernel [slides and report]

- Expectation-Maximization for a mixture of Gaussians [code,report]

- Non-stationary bandit algorithm [slides]

- Multiple deep learning projects [code]

TEACHING EXPERIENCES

Teaching Assistant, Sharif University of Technology (*More information is available on my* teaching page)

- **Undergraduate Courses**: Probability and Statistics (Sp'23, Sp'24, Fa'24), Signals and Systems (Fa'23, Sp'24), Linear Algebra (Fa'23, Sp'24), Machine Learning (Fa'23, Sp'24, Fa'24 Lead TA, Sp'25), Convex Optimization I (Fa'24, Sp'25), Reinforcement Learning (Sp'26)

- **Graduate Courses**: Deep Learning (Fa'24), Deep Reinforcement Learning (Sp'25) High-Dimensional Probability Analysis (Sp'26)

VOLUNTEER EXPERIENCE

- **Scientific Associate Principal**, Student Association, Sharif University (Resana)   Jun 2023 – Jul 2024
Resana is the scientific community of the Electrical Engineering Department at Sharif University of Technology.

- **Organizer**, First AIVengers Summer School   Sep 2023
Planned and managed a global AI/ML student event featuring Ph.D. tutors from leading institutions.

- **Central Council Member**, ReACT 2024   Dec 2024
Helped organize a large-scale event with 1,500+ attendees and internationally recognized researchers.

SKILLS AND INTERESTS

- **Programming:** Python (PyTorch, OpenCV, LangChain, Django), MATLAB, C++, Java, MySQL

- **Languages:** Persian, English, Turkish, Russian (Elementary), German (Beginner)

- **Interests:** Chess, Cinema, Soccer, Literature

HONORS AND AWARDS

- **Ranked 51st** mong 165,000 participants in the Mathematics and Physics University Entrance Exam,   2021