Ali Ekhterachian

+98 - 9908492206 | Email | LinkedIn | Homepage

EDUCATION

- **Sharif University of Technology** **Tehran, Iran**
  Bachelor of Science in Electrical Engineering, Communication Networks and Systems Sep. 2021 – Present
  - Overall GPA: **18.74 / 20**
  - Last four semesters GPA: **19.12 / 20**

RESEARCH INTERESTS

- **Machine Learning**
- **Computer Vision**
- **Signal Processing**
- **Robotics and Autonomous Systems**
- **Communication Systems**

RESEARCH EXPERIENCE

- **Software-Defined Communication Networks Lab** *Sharif University of Technology*
  Supervised by Prof. Babak Khalaj
  - *Research Assistant (Undergraduate Thesis)* *Apr. 2024 – Present*
  - Developing an autonomous four-wheeled robot for Object Goal Navigation with natural language interaction, capable of operating both in simulated and real-world environments.
  - This project resulted in the paper **CORE-3D** (under review at ICLR), listed in the Publications & Preprints section.

PUBLICATIONS & PREPRINTS

- **CORE-3D: Context-aware Open-vocabulary Retrieval by Embeddings in 3D**
  - *Under review at ICLR 2026, arXiv:2509.24528*
  - Equal contribution. **My contributions:** retrieval methodology, experiments, manuscript revision.

SELECTED PROJECTS

- **Autonomous Object-Goal Navigation Robot** *Sharif University of Technology*
  - Developed an autonomous four-wheeled robot capable of Object-Goal Navigation with natural language interaction in both simulated (Webots) and real-world environments.
  - Collaborated effectively in a 4-member multidisciplinary team on integration, perception–navigation alignment, and debugging during deployment.
  - Additional project materials and demonstration video are available on my GitHub homepage.
- **Computational Efficiency in Trajectory Prediction** *Sharif University of Technology*
  - Conducted under Dr. Sajjad Amini's supervision for Deep Generative Models course.
  - Evaluated multiple trajectory prediction models on Jetson Nano and Quadro RTX.
  - Provided comparative analysis beyond accuracy to assess model efficiency.

- **Research Assistant for Paper Recommendation using LLMs** *Sharif University of Technology*
  - Conducted under Prof. Babak Khalaj's supervision for a Data Science project.
  - Crawled academic datasets from the web for evaluation.
  - Applied various preprocessing techniques and regression models on collected data.
  - Developed an LLM-powered assistant to recommend research papers based on input descriptions.
- **Private Learning and Machine Unlearning Techniques in ML** *Sharif University of Technology*
  - Conducted under Dr. Rouhollah Amiri's supervision for ML course.
  - Implemented SISA algorithm for efficient unlearning via data sharding and aggregation.
  - Implemented backdoor attacks and evaluated model resistance against them.
  - Analyzed metrics and performed membership inference attacks to assess privacy.
  - Enhanced model security using privacy-preserving techniques.
- **JPEG Image Compression** *Sharif University of Technology*
  - Conducted under Dr. Hamid Behroozi's supervision for Signals and Systems course.
  - Implemented JPEG Image Compression Algorithm using MATLAB.
  - Project available at: GitHub Repository
- **MIPS Data-Path Implementation** *Sharif University of Technology*
  - Conducted under Dr. Mohammad Reza Movahedin's supervision for Computer Architecture course.
  - Implemented Single-Cycle and Multi-Cycle MIPS data path using Verilog and ModelSim, supporting main R-type/I-type instructions, branches, and jumps.
  - Project available at: GitHub Repository
- **Messenger for PC** *Sharif University of Technology*
  - Developed under Prof. Matin Hashemi's supervision for Object-Oriented Programming course.
  - Implemented PC messenger application using Java.
  - Project available at: GitHub Repository
- **Head Football Mini Game** *Sharif University of Technology*
  - Developed under Dr. Abdollah Arasteh's supervision for Fundamentals of Programming course.
  - Implemented Head-Soccer game using C++.
  - Project available at: GitHub Repository

NOTABLE COURSES

Course	Course Instructor	Score / 20
Digital Communications	Prof. Mohammad Karbasi	Ongoing
Deep Reinforcement Learning†	Prof. Mohammad Hossein Rohban	20
Communications Special Topics (Deep Generative Models)†	Prof. Sajjad Amini	19
Fundamentals of Data Science	Prof. Babak Khalaj	20
Introduction to Machine Learning	Prof. Rouhollah Amiri	19.1
Convex Optimization	Prof. Maryam Babazadeh	16.6
Fundamentals of Crypto and Network Security	Prof. Siavash Ahmadi	20
Artificial Intelligence	Prof. Mahdieh Soleymani	20
Communication Systems	Prof. Mohammad Reza Pakravan	19.5
Mathematical Methods in Eng. (Linear Algebra)	Prof. Rouhollah Amiri	20
Signals and Systems	Prof. Hamid Behroozi	19.8
Computer & Microprocessor Architecture & Lab	Dr. Mohammad Reza Movahedin	20
Electromagnetism	Prof. Behzad Rejaei Salmasi	19.5
Object-Oriented Programming	Prof. Matin Hashemi	19.4
Fundamentals of Programming	Prof. Abdollah Arasteh	20

† *Graduate-level course.*

TECHNICAL SKILLS

- **Programming**: Python, MATLAB, C/C++, Java, SQL, Verilog, and MIPS Assembly
- **Professional Software**: Simulink, ModelSim, Xilinx ISE, PSpice, LTspice, Proteus, and Altium Designer
- **Drawing & Typesetting** : Photoshop, Microsoft Office, and LaTeX
- **Languages**: Persian (Native), English (Professional), Arabic (Elementary)

TEACHING EXPERIENCE

- **Convex Optimization | Prof. Rouhollah Amiri** ***Sep. 2024 – Jan. 2025***
  - Prepared exercises and solutions covering DCP rules and applied convex optimization problems.
- **Fundamentals of Data Science | Prof. Hamed Shah-Mansouri** ***Feb. 2025 – Jun. 2025***
  - Assisted in selecting suitable research papers for student projects and evaluating their reproduced results.
- **Signals and Systems | Prof. Mohammad Mahdi Mojahedian** ***Feb. 2024 – Jun. 2024***
  - Authored problem sets and quizzes on Discrete Fourier Transform and Sampling concepts.
- **Electrical and Electronic Circuits | Prof. Siavash Bayat** ***Sep. 2024 – Jun. 2025***
  - Designed and graded quizzes and exercises for both theoretical and practical components.
- **Electrical Circuit Theory | Prof. Rouhollah Amiri** ***Sep. 2024 – Jan. 2025***
  - Developed exercise materials on Laplace-domain circuit analysis and contributed to the design of student projects.
- **Digital Logic Circuits | Prof. Siavash Bayat** ***Sep. 2024 – Jan. 2025***
  - Designed quizzes and practical logic design problems.
- **Object-Oriented Programming | Prof. Bijan Vosoughi Vahdat** ***Feb. 2023 – Jun. 2023***
  - Designed assignments on structured programming, GUI development, and UML modeling in Java.
- **Fundamentals of Programming | Prof. Bijan Vosoughi Vahdat** ***Sep. 2022 – Jan. 2023***
  - Designed and graded theoretical and programming assignments in C++, emphasizing pointer-based design.

REFERENCES

- **Prof. Babak Khalaj**
  Professor, Department of Electrical Engineering
  Sharif University of Technology, Azadi Avenue, Tehran, Iran
  Phone: +98 (21) 6616-5958 | Email: khalaj@sharif.edu | Homepage
- **Prof. Rouhollah Amiri**
  Assistant Professor, Department of Electrical Engineering
  Sharif University of Technology, Azadi Avenue, Tehran, Iran
  Phone: +98 (21) 6616-5945 | Email: amiri@sharif.edu | Homepage