Ali Ekhterachian

+98 - 9908492206 | Email | LinkedIn | GitHub

EDUCATION

- **Sharif University of Technology** **Tehran, Iran**
  - Bachelor of Science in Electrical Engineering
  - Specializing in Communication Systems
  - Sep. 2021 – Present

RESEARCH INTERESTS

- **Machine Learning**
- **Large Language Models**
- **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, enabling precise object localization and manipulation.
  - Implementing a natural-language processing interface for intuitive text and voice-based control.

PROJECTS

- **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.
  - Measured computational cost in terms of energy consumption and inference time.
  - Provided comparative analysis beyond accuracy to assess model efficiency.
  - Addressed a research gap by focusing on computational complexity trade-offs.
- **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.
- **Privacy-Preserving 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 machine unlearning through data sharding and result aggregation.
  - Implemented backdoor attacks and evaluated model resistance against them.

- Analyzed performance metrics and conducted membership inference attacks to assess privacy protection.
- 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 Dr. 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 Professor
Deep Reinforcement Learning	Dr. Mohammad Hossein Rohban
Communications Special Topics (Deep Generative Models)	Dr. Sajjad Amini
Fundamentals of Data Science	Prof. Babak Khalaj
Introduction to Machine Learning	Dr. Rouhollah Amiri
Convex Optimization	Dr. Maryam Babazadeh
Fundamentals of Crypto and Network Security	Dr. Siavash Ahmadi
Artificial Intelligence	Dr. Mahdieh Soleymani
Communication Systems	Dr. Mohammad Reza Pakravan
Mathematical Methods in Eng. (Linear Algebra)	Dr. Rouhollah Amiri
Signals and Systems	Dr. Hamid Behroozi
Probability and Statistics	Dr. Arash Amini
Computer & Microprocessor Architecture & Lab	Dr. Mohammad Reza Movahedin
Electromagnetism	Dr. Behzad Rejaei Salmasi
Linear System Control	Prof. Mohammad Saleh Tavazoei
Electronics 2	Dr. Fatemeh Akbar
Electronics 1	Dr. Reza Sarvari
Object-Oriented Programming	Dr. Matin Hashemi
Fundamentals of Programming	Dr. Abdollah Arasteh
Engineering Mathematics	Dr. Mehdi Ahmadi-Boroujeni
Differential Equation	Dr. Alireza Bahraini
Multivariable Calculus	Dr. Mohammad Gholamzadeh
Single Variable Calculus	Dr. Bahman Khanedani
Fundamentals of Physics 2	Prof. Mahmud Bahmanabadi

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), and Arabic (Preliminary)

TEACHING EXPERIENCE

- **Fundamentals of Data Science | Dr. Hamed Shah-Mansouri** ***Feb. 2025 – Jun. 2025***
  - Designing Problem Sets for Fundamentals of Data Science.
- **Convex Optimization | Dr. Rouhollah Amiri** ***Sep. 2024 – Jan. 2025***
  - Designed exercises covering DCP rules and various convex optimization problems.
- **Electrical Circuit Theory | Dr. Rouhollah Amiri** ***Sep. 2024 – Jan. 2025***
  - Graded assignments and conducted exercise classes focused on circuit analysis using Laplace transforms.
  - Designed and supervised project work related to electrical circuits.
- **Electrical and Electronic Circuits | Dr. Siavash Bayat** ***Sep. 2024 – Jan. 2025***
  - Designed quizzes for the course in the Electronic Circuit Engineering department.
- **Digital Logic Circuit | Dr. Siavash Bayat** ***Sep. 2024 – Jan. 2025***
  - Designed quizzes for the course.
- **Signals and Systems | Dr. Mohammad Mahdi Mojahedian** ***Feb. 2024 – Jun. 2024***
  - I am presently designing theoretical problem sets and quizzes for the course.
  - The subjects assigned to me include Discrete Fourier Transform and Sampling.
- **Object-Oriented Programming | Dr. Bijan Vosoughi Vahdat** ***Feb. 2023 – Jun. 2023***
  - Designed an assignment involving programming an app store and creating its UML diagrams to aid students in structured programming (using Java).
  - Graded homework on Java GUI development, utilizing JavaFX or other GUI toolkits such as Swing.
- **Fundamentals of Programming | Dr. Bijan Vosoughi Vahdat** ***Sep. 2022 – Jan 2023***
  - Designed and graded theoretical and programming problem sets focusing on C++ programming language, with an emphasis on pointers.

REFERENCES

- Available Upon Request