Tehran, Iran
+98 930 600 8661
matin.alnj@gmail.com
Date of Birth: 16 June 2002

Matin Alinejad

Publications

2024 **C2P: Featuring Large Language Models with Causal Reasoning**, *arXiv preprint*
Abdolmahdi Bagheri*, **Matin Alinejad***, Kevin Bello, Alireza Akhondi-Asl

Honors and Awards

2020 **National Universities Entrance Exam**, *Mathematics and Physics*, Ministry of Science
Ranked **101st** out of 150,000+ participants

Education

2020–Present **Bachelor of Science in Electrical Engineering**, *Sharif University of Technology*, Tehran, Iran, GPA: 3.58/4

2017–2020 **High School Diploma in Mathematics and Physics**, *Shahid Beheshti High School (NODET)*, Mazandaran, Iran, GPA: 19.2/20

Research Experience

2025–Present **RIML-Lab, Sharif University of Technology**, *Supervised by Prof. Mohammad Hossein Rohban and Prof. Mohammad Hossein Yassaee*, Tehran - Iran

- **Causal/Counterfactual Reasoning in LLMs**: Developing a benchmark dataset designed to challenge and evaluate the ability of large language models (LLMs) in causal inference and counterfactual reasoning tasks.
- This involves creating realistic, diverse, and challenging scenarios for testing the models' understanding of causality.
- This project aims to propose novel solutions (propose new reward functions with "Causal RL" theme) to enhance and train LLMs for improved performance in these tasks, addressing their current limitations in reasoning and decision-making under causal and counterfactual scenarios.

2024–Present **Independent Research**, *Supervised by Ehsan Sharifian*

- **Experiment Design for Causal Discovery:** This research focuses on designing efficient experimental setups to uncover causal relationships in complex systems. We are developing methods that utilize statistical and machine learning techniques to identify causality from observational and interventional data. The project explores the trade-offs between experimental cost, data efficiency, and the accuracy of causal inference.

2023–2024 **Independent Research**, *Supervised by Dr. Abdolmahdi Bagheri and Prof. Alireza Akhondi-Asl*

- **Causal Reasoning in LLMs:** This research explores whether LLMs have inherent causal reasoning abilities. We tested LLMs on tasks requiring causal inference, analyzing their strengths and limitations.
- Collaboratively, we proposed the **C2P** (Causal Chain of Prompting) framework, integrating causal discovery algorithms into LLMs to enhance their causal reasoning.
- The project bridges traditional machine learning and causal reasoning, focusing on adapting LLMs for better causal understanding.

Research Interests

- Causal Inference and Causal Discovery
- Causal Reinforcement Learning
- Privacy in Statistical Models and ML
- Control/Feedback/Dynamical Systems
- Optimization in Theoretical and Applied ML
- Game Theory and Mechanism Design

Academic Services

Head Teaching Assistance

Spring 2025 **Mathematical Methods in Engineering (Linear Algebra)**, *Sharif University of Technology*, Tehran, Iran, Instructor: Mehdi Molkaraie

Teaching Assistance

Spring 2025 **Image Processing**, *Sharif University of Technology*, Tehran, Iran, Instructor: Hossein Peyvandi

Spring 2025 **Industrial Control**, *Sharif University of Technology*, Tehran, Iran, Instructor: Behzad Ahi

Fall 2024 **Linear Control Systems**, *Sharif University of Technology*, Tehran, Iran, Instructor: Behzad Ahi

Fall 2024 **Security and Privacy in Machine Learning (Graduate Level)**, *Sharif University of Technology*, Tehran, Iran, Instructor: Amir Mahdi Sadeghzadeh

Spring 2024 **Security and Privacy in Machine Learning (Graduate Level)**, *Sharif University of Technology*, Tehran, Iran, Instructor: Amir Mahdi Sadeghzadeh

Professional Experience

Course Projects

Fall 2024 **Machine Learning and Vision Topics**, *Machine Learning and Vision Laboratory*, Sharif University of Technology

Developed efficient methods in machine learning and computer vision, including dimensionality reduction (PCA), linear regression, classification (Fisher LDA, SVM), and image processing (normalization, convolution, gradient computation, edge detection). Worked with feature extraction techniques (SIFT, SOG, LBP, Gabor, HOG) and optical flow estimation (Horn–Schunck, Lucas–Kanade, dense/sparse methods). Applied neural networks for pattern recognition and image analysis.

Fall 2024 **Optimal Control of Nonlinear Systems via Koopman Operator**, *Optimal Control*, Sharif University of Technology

Validated and simulated the results of the paper "Data-Driven Optimal Control of Unknown Nonlinear Dynamical Systems Using the Koopman Operator," PMLR 2025.

Spring 2024 **Machine Unlearning and Membership Inference Attacks**, *Introduction to Machine Learning*, Sharif University of Technology

Developed efficient methods for machine unlearning, enabling data removal from models without full retraining. Also, explored membership inference attacks and implemented privacy-preserving techniques to mitigate these risks.

Fall 2023 **Optimal and Limiting Factors of Differentially Private Learning with Public Data**, *Privacy in Statistics and Machine Learning*, Sharif University of Technology

Developed algorithms for (ϵ, δ)-differentially private supervised domain adaptation, addressing challenges in both convex and non-convex problems. The study demonstrates improved sample complexity using public data, while achieving competitive performance compared to non-private methods.

Spring 2023 **Fast ICA and EASI Algorithm**, *Blind Source Separation and Sparse Signal Representation*, Sharif University of Technology

In this project, we implemented the Fast Independent Component Analysis (Fast ICA) and Equivalent Adaptive Source Independence (EASI) algorithms using MATLAB to solve blind source separation problems. We evaluated the performance of both algorithms through simulations, focusing on their convergence speed, accuracy in separating signals, and robustness to noise.

Spring 2023 **Stochastic Optimization**, *Convex Optimization I*, Sharif University of Technology

Explored stochastic optimization and implemented the Stochastic Gradient Descent (SGD) algorithm in Python, analyzing its performance and improvements in stability, comparing it with traditional optimization methods.

Spring 2022 **Shazam Music Recognition Algorithm**, *Signals and Systems*, Sharif University of Technology

Developed a music recognition system inspired by Shazam, utilizing signal processing techniques like FFT (Fast Fourier Transform) to compute music fingerprints and recognize songs based on short audio samples through real-time matching.

Spring 2021 **Farm Frenzy Game**, *Object-Oriented Programming*, Sharif University of Technology

Developed the *Farm Frenzy* game using Java and JavaFX with an object-oriented approach.

Fall 2020 **Brick Breaker Game**, *Fundamentals of Programming (C++)*, Sharif University of Technology

Created a *Brick Breaker* game using C++ and the SDL library.

Teaching Experience

2023–Present **Mathematics Instructor**, *Afarinesh High School*

2022–2023 **Mathematics and Physics Instructor**, *Zehne-Ziba Institute*

2023 **Blockchain Workshop Mentor**, *Rasta Group*, Tehran, Iran

Mentored high school students in a workshop on blockchain technology.

2022 **Source Coding Workshop Mentor**, *Rasta Group*, Tehran, Iran

Mentored high school students in a workshop on source coding.

2020–2022 **Mathematics and Physics Instructor**, *Shahid Beheshti High School (NODET)*

Taught advanced mathematics and physics to pre-university students.

Notable Courses and Studies

Graduate Courses

Fall 2023 **Advanced Engineering Mathematics**, *Sharif University of Technology*, Instructor: Mohammad Saleh Tavazoei, Grade: 18.9/20
Functional analysis and applied linear algebra

Fall 2023 **Differential Privacy in Statistics and Machine Learning**, *Sharif University of Technology*, Instructor: Mohammad Hossein Yassaee, Grade: 18.9/20

Undergraduate Courses

Fall 2024 **Machine Learning and Vision Laboratory**, *Sharif University of Technology*, Instructor: Hoda Mohammadzade, Grade: 19.3/20

Spring 2024 **Industrial Control**, *Sharif University of Technology*, Instructor: Behzad Ahi, Grade: 19.6/20

Fall 2022 **Linear Control Systems**, *Sharif University of Technology*, Instructor: Amin Rezaeizadeh, Grade: 16.4/20

Spring 2021 **Differential Equations**, *Sharif University of Technology*, Instructor: Mohammad Hadi Mostafid, Grade: 16.9/20

Spring 2021 **Calculus I**, *Sharif University of Technology*, Instructor: S. Reza Moghadasi, Grade: 17.2/20

Fall 2020 **Fundamentals of Programming (C++)**, *Sharif University of Technology*, Instructor: Abdollah Arasteh, Grade: 18.9/20

Side Studies

2024–Present **Learning Theory Study Group**, Weekly discussions on Francis Bach's *Learning Theory from First Priciples*.

2023–2024 **Linear Algebra Study Group**, Weekly presentations and Q/A on Sheldon Axler's *Linear Algebra Done Right*.

2023–2024 **Self-Study on Causality**, Independent study of Judea Pearl's *Causality: Models, Reasoning, and Inference* and *The Book of Why*.

Technical and Personal Skills

Programming Languages

Expert Python (NumPy, PyTorch, OpenDP, Opacus, Pandas, SciPy, etc.), MATLAB (Optimization, Curve Fitting, System Identification, PID Tuner, MATLAB Coder, Simulink, etc.), C++

Intermediate Julia, C, Java

Languages

Persian Native proficiency

English Professional working proficiency

Arabic Elementary proficiency

French Elementary proficiency

Sports

Volleyball Professional player, invited to Iran's U19 National Team; currently captain of Sharif University Volleyball Team. Previously played in Iran's Super League for Kalleh Sport Team.