Amirali Fakhari Zavareh

amiralifakhari9@gmail.com
linkedin.com/in/amirali-fakhari-zavareh
https://github.com/AmirAliFakhari

Education

Jul 2022 – Jun 2026 **Bachelor's Degree in Applied Mathematics**, *Amirkabir University of Technology*, Tehran, Iran, GPA: 3.6/4.0 (last 4 semesters)

Sep 2023 – Jun 2026 **Bachelor's Minor Degree in Computer Science**, *Amirkabir University of Technology*, Tehran, Iran

Research Interests

- AI In Healthcare
- Computational Biology
- Physics-Informed Neural Networks
- PDEs and Mathematical Modeling
- Deep Reinforcement Learning
- Causal Discovery, Causal Inference

Publications

- **Physics-Informed DeepONets (PI-DeepONets) for Modeling Cell Invasion** Rahbaria, P., Fakhari Zavareh, A.A., Taheri Soufi, M., Pashapour, M., Abbaszadeh, M.* *Partial Differential Equations and Applications*, 2025. (Submitted)
- **What are Graphical Causal Models and How Can They Enhance Medical Research? A Narrative for MDs and Engineers** Mahmoudi, M.H., Fakhari Zavareh, A.A. (Under preparation)

Research Experience

Apr 2025 – Jun 2025 **Research Collaborator**, *Sharif University of Technology*, Tehran, Iran

- Conducted a **causal reasoning** project with a Master's student.
- Designed workflows for **causal discovery** on customer chain dataset.
- Implemented and tested **causal discovery algorithms** in Python.
- Co-authored a paper on **causal AI in medical research**.

Sep 2024 – Sep 2025 **Research Assistant**, *Mindlab-AUT*, Tehran, Iran

- Research on PDE solving with DeepONets and PINNs.
- Developed neural operator approaches in **Python** using **JAX**.
- Applied physics-informed models to **computational biology**.

Aug 2025 – Present **Research Collaborator**, *Shanghai Jiao Tong University*, Shanghai, China

- Acceleration of **diffusion models**.
- Improving **RL agent safety**.
- Working on **representation learning** and **imitation learning**.

Teaching Experience

Jul 2025 – Present **Undergraduate Teaching Assistant – Deep Learning**, *Amirkabir University of Technology*, Tehran, Iran

Feb 2025 – May 2025 **Undergraduate Teaching Assistant – Numerical Analysis**, *Amirkabir University of Technology*, Tehran, Iran

Projects

Jun 2025 – Aug 2025 **Causal Graph Discovery for Customer Churn Prediction**

- Implemented DECI, LiNGAM, NOTEARS, PC-GIN, GRaSP
- Applied to IBM Telco churn dataset
- Integrated domain-specific constraints
- Generated interpretable causal graphs

Oct 2024 – Apr 2025 **PINN for Reaction-Diffusion Equations (Private until publication)**

- Implemented PINN model in JAX
- Applied physics-based composite loss
- Used single MLP architecture
- Validated on reaction-diffusion systems

Oct 2024 – Apr 2025 **Physics-Informed DeepONet for Reaction-Diffusion Equations (Private until publication)**

- Built PI-DeepONet architecture in JAX
- Applied composite physics-informed loss
- Designed custom MLP networks
- Solved reaction-diffusion PDEs

Jul 2025 – Present **Accelerating Diffusion Models at Inference Time (In progress)**

- Optimizing denoising loop efficiency
- Exploring fast trajectory generation
- Reducing inference time in diffusion models
- Benchmarking performance improvements

Skills

Programming Languages: Python, C++, C, Matlab, R

Machine Learning Frameworks: PyTorch, TensorFlow, JAX, numpy, pandas

Tools & Platforms: CUDA, Docker