

Amirali Fakhari Zavareh

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🐙 <https://github.com/AmirAliFakhari>

Education

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

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

Research Interests

- Deep Reinforcement Learning
- Imitation Learning
- Human-Robot Collaboration
- AI-Safety
- Causal Discovery, Causal Inference
- Physics-Informed Neural Networks

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

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

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

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

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

Apr 2025 – **Research Collaborator**, *Sharif University of Technology*

Jun 2025

- **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 paper on causal AI in **medical** research.

Teaching Experience

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

- Assisted Dr. Fatemeh Shakeri with lectures and slides.
- Supported students with assignments and questions.

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

- Assisted Prof. Mostafa Shamsi with teaching and grading.
- Held office hours for student support.

Projects

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

Present

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

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

Aug 2025

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

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

Apr 2025

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

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

Apr 2025

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

Skills

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

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

Tools & Platforms: CUDA, Docker

Volunteer Experience

Founder and Host, 3:14 (π) Podcast

Founded and host a podcast at Amirkabir University of Technology, connecting academia and industry through interviews on career journeys and lessons learned.