SHERVIN KHALAFI

(+1) 215-240-9220 ⋄ shervink@seas.upenn.edu

RESEARCH INTERESTS

My main research interest lies in the intersection of generative models and optimization theory. Currently, I am developing constrained optimization frameworks for training generative models (diffusion models in particular) under requirements. I am also exploring diffusion models for graph generation.

EDUCATION

University of Pennsylvania Philadelphia, PA

- Doctor of Philosophy, **Electrical and Systems Engineering** Jan 2023 - Present
  School of Engineering and Applied Sciences
  Advisor: Prof. Alejandro Ribeiro
  GPA: 3.83/4.00

Sharif University of Technology Tehran, Iran

- Bachelor of Science, **Electrical Engineering** 2018 - 2022
  GPA: 19.22/20.00, Highest Distinctions

PUBLICATIONS

Published Papers

[1] *Composition and Alignment of Diffusion Models using Constrained Learning*
Shervin Khalafi, Ignacio Hounie, Dongsheng Ding, and Alejandro Ribeiro
International Conference on Neural Information Processing Systems (Accepted, NeurIPS 2025)

[2] *Constrained Diffusion Models via Dual Training*
Shervin Khalafi, Dongsheng Ding, and Alejandro Ribeiro
International Conference on Neural Information Processing Systems (Published, NeurIPS 2024)

[3] *Neural Tangent Kernels Motivate Graph Neural Networks with Cross-Covariance Graphs*
Shervin Khalafi, Saurabh Sihag, and Alejandro Ribeiro
International Conference on Machine Learning (Published, ICML 2024)

REVIEWER EXPERIENCE

[1] Served as peer reviewer for International Conference on Neural Information Processing Systems (Neurips 2025)

[2] Served as peer reviewer for International Conference on Machine Learning (ICML 2025)

HONORS AND AWARDS

- **Silver Medal**, *International Physics Olympiad (IPhO 2018, Lisbon)*, 2018
- **Gold Medal**, *National Physics Olympiad (Iran)*, 2017
- **The Dean's Fellowship**, ESE Department, *University of Pennsylvania*, 2023
- **Academic Achievement Award**, EE Department, *Sharif University of Technology*, 2022

TEACHING EXPERIENCE

University of Pennsylvania, Philadelphia, PA

- **Undergraduate Courses**: *Signals and Systems* (Spring 2024), *AI Lab: Data, Models, Decisions* (Fall 2025)
- **Graduate Courses**: *Graph Neural Networks* (Fall 2023, Fall 2024)

Sharif University of Technology, Tehran, Iran

- **Undergraduate Courses**: *Electrical Circuit Theory* (Fall 2020), *Signals and Systems* (Spring 2021), *Numerical Methods in Eng.* (Spring 2021)

INDUSTRY EXPERIENCE

- **Summer Intern** @ Hamrah e Aval R&D Group (MCI Lab), Tehran, Iran Summer 2022
  Supervisor: Dr. Mohammad Fakharzadeh

TALKS AND PRESENTATIONS

- Poster presentation on "Neural Tangent Kernels Motivate Graph Neural Networks with Cross-Covariance Graphs". *NSF Annual Site Visit, The Institute for Learning-enabled Optimization at Scale (TILOS), June 2024*

SKILLS

Python (Pytorch, Huggingface), Matlab, C/C++

RELEVANT COURSEWORK

University of Pennsylvania: Random Matrix Theory, Probability Theory, Graph Neural Networks, Geometric Deep Learning, Deep Generative Models, Algorithms for Big Data, Convex Optimization, Machine Learning for Time-Series Data

Sharif University of Technology: High Dimensional Probability, Theory of Machine Learning, Algorithms, Numerical Optimization, Computational Neuroscience, Graph Signal Processing