# ZAHRA SODAGAR

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## EDUCATION

**University of Maryland** *As of Jan. 2025*
Ph.D. in Computer Science

**Sharif University of Technology** *Sep. 2019 - Jun. 2024*
B.Sc. in Electrical Engineering, Minor in Applied Mathematics GPA: 18.94/20 (≡ 3.95/4)

**Manzoumeh Kherad Institute** *Sep. 2007 - Jun. 2019*
Diploma in Mathematics and Physics GPA: 19.79/20 (≡ 4.00/4)

## RESEARCH INTERESTS

- Machine Learning (Applied and Theoretical)
- Generative Models
- Robustness
- Privacy, Fairness, Generalization & Interpretability
- Cognitive Science and Cognitively-inspired AI
- Statistics and Information Theory

## PUBLICATIONS

Teresa Yeo, Oğuzhan Fatih Kar, **Zahra Sodagar**, Amir Zamir, ***Rapid Network Adaptation: Learning to Adapt Neural Networks Using Test-Time Feedback***. In Proceedings of the IEEE/CVF International Conference on Computer Vision (**ICCV**), 2023. [Website - Presentation]

## RESEARCH EXPERIENCES

**Visual Intelligence and Learning Lab, EPFL** Lausanne, Switzerland
*Research Intern under the supervision of Prof. Amir Zamir* *Jul. 2022 - Nov. 2022*

- **Domain Adaptation of Neural Networks Using Test-Time Feedback**
  Proposed an efficient test-time adaptation framework utilizing a feedback signal, utilized either by a robust loss function (online adaptation), or a pre-trained side network to amortize the error.

**Department of Information Engineering, The Chinese University of Hong Kong** Sha Tin, Hong Kong
*Research Assistant under the supervision of Prof. Farzan Farnia* *Jul. 2023 - Present*

- **Generalization of Generative Models**
  Proposed and investigated metrics and algorithms for evaluating generalization of generative models based on a review of several papers, addressing the generalization and algorithm stability of generative models and optimization algorithms.

**Department of Electrical Engineering, Sharif University of Technology** Tehran, Iran
*Bachelor Thesis under the supervision of Prof. Mohammad Hossein Yassaee* *Dec. 2022 - Present*

- **Generalization and Privacy of Diffusion Models (In collaboration with Prof. Farzan Farnia)**
  A study of the generalization property of diffusion models by analyzing the mechanisms and compositions, experimenting with alternative mechanisms, and using Differential Privacy methods to improve the generalization and privacy.
- **Data Compression Using Privacy Preserving Neural Networks**
  Addressing various problems and ideas after surveying numerous neural network based methods for lossy and lossless compression, different attacks, and privacy preserving methods in machine learning, in notions of differential privacy.

**Speech and Language Processing Lab, Sharif University of Technology** Tehran, Iran
*Research Intern under the supervision of Prof. Hossein Sameti* *Jan 2024 - Present*

- **Automatic Speech Understanding Using Large Language Models**
  Developing a framework that adapts cross domain encoders and combines them with LLMs for Persian Language.

## TEACHING EXPERIENCES

**Teaching Assistant, Sharif University of Technology**

- Generative Models * — *Fall 2024*
- Data Privacy in Statistics & ML * — *Fall 2023*
- Convex Optimization — *Spring 2023*
- Machine Learning — *Fall 2022*
- Probability and Statistics — *Fall 2022*
- Signals and Systems — *Spring 2022*
- Engineering Mathematics — *Fall 2021*
- Electrical Circuits and Lab — *Fall 2021, Spring 2022*
- Advanced Programming — *Spring 2021, Spring 2022*

## OTHER EXPERIENCES

Committee member of The Scientific & Cultural Association of Resana — *Jun. 2021 - Aug. 2022*
- Elected as the treasurer and scientific co-adviser of the Scientific & Cultural Association of Resana.

Mentoring the students of The Class of 2025 of Electrical Engineering — *Sep. 2021 - Present*

## AWARDS AND ACHIEVEMENTS

- Ranked in the top 7% out of 160+ students of The Class of 2023 for four successive years.
- Among the 9 selected students participating in the ITCSC Summer Research Program at CUHK, 2023.
- Awarded as one of The Top 3 Outstanding Students of the Electrical Engineering Department, 2023.
- Among the top 1% out of 4000+ applicants participating in the Summer@EPFL Internship Program, 2022.
- Ranked $75^{th}$ ($45^{th}$ in region 1) among 160,000+ students in the Iran National University Entrance Exam, 2019.
- Received the Most Innovative Research Award at the International Student Science Fair (ISSF), 2017.
- Received the Certificate of High Distinction at the Australian Mathematics Competition (AMC), 2015.

## SELECTED COURSES

**Sharif University of Technology**

- Deep Learning *
- Fundamentals of Machine Learning
- Regression Analysis (Statistical Learning)
- Computer Vision
- Information Theory in ML & Statistics *
- High Dimensional Statistics *
- Stochastic Process *
- Convex Optimization
- Numerical Methods in Optimization *
- AI and Biological Computation
- Advanced Mathematical Statistics
- Probability and Statistics
- Linear Algebra
- Engineering Mathematics
- Signals and Systems
- Advanced Programming
- Linear Control
- Introduction to Cryptography

**Audited Courses from Other Universities**

- Stanford CS236: Deep Generative Models — Dr. Stefano Ermon
- Stanford CS330: Deep Multi-Task and Meta Learning — Dr. Chelsea Finn
- Waterloo CS860: Algorithms for Private Data Analysis — Dr. Gautam Kamath
- Boston CS591-S1: Privacy in Statistics and ML — Dr. Adam Smith
- Stanford CS364a: Algorithmic Game Theory — Dr. Tim Roughgarden
- Stanford CS231n: Deep Learning for Computer Vision — Dr. Fei-Fei Li
- Stanford CS230: Deep Learning — Dr. Andrew NG
- Stanford CS229: Machine Learning — Dr. Andrew NG

* Graduate level course

## SKILLS

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|---|---|
| **Programming Languages** | Python, MATLAB, Java, R, C/C++, MIPS/8051 Assembly, Verilog, Bash, LaTeX. |
| **Frameworks** | PyTorch, TensorFlow, OpenCV, Opacus, OpenDP, CVXPY, Scikit-Learn. |
| **Softwares** | Adobe Softwares (Illustrator, Lightroom, Photoshop), Proteus, ModelSim, SPICE. |

## LANGUAGES

**Persian:** Native
**English:** Proficient (TOEFL iBT: 106/120, R:28/L:25/S:26/W:27)
**French:** Elementary (A2)
**Arabic:** Elementary

## HOBBIES AND INTERESTS

Photography, travelling, reading, playing the Setar, taking long walks & hiking, and learning new languages.