

Arman Zarei

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EDUCATION

- **University of Maryland, College Park** Maryland, USA
Ph.D. in Computer Science - Advised by Prof. S. Feizi
GPA: 4.0/4.0
Aug. 2023 - Present
- **Sharif University of Technology** Tehran, Iran
B.Sc. in Computer Engineering
GPA: 19.29/20 (3.98/4.00) - ranked among the top ten
GPA of last four semesters: 19.87/20 (4.00/4.00)
Sep. 2018 - Feb. 2023
- **Shahid Soltani High School (NODET)** Karaj, Iran
Diploma in Mathematics and Physics
Sep. 2014 - June 2018

RESEARCH INTERESTS

Generative Models, Computer Vision, 3D Vision, Adversarial Robustness, Deep Learning

PUBLICATIONS

- **Understanding and Mitigating Compositional Issues in Text-to-Image Generative Models**
A Zarei, K Rezaei, S Basu, M Saberi, M Moayeri, P Kattakinda, S Feizi Under Review - NeurIPS 2024
- **Enhancing Epileptic Seizure Detection with EEG Feature Embeddings**
A Zarei, B Zhu, M Shoaran IEEE BioCAS 2023 (Oral)
- **Improving Adversarial Training Through the Lens of Out-of-Distribution Detection**
M Azizmalayeri*, A Zarei*, A Isavand, MH Rohban CSICC 2023
- **Your Out-of-Distribution Detection Method is not Robust!**
M Azizmalayeri, A Soltani Moakar, A Zarei, R Zohrabi, MT Manzuri, MH Rohban NeurIPS 2022

Please refer to [Google Scholar](#) for other publications.

RESEARCH EXPERIENCE

- **University of Maryland, College Park** Maryland, United States
Research Assistant - Generative Models
Aug 2023 - Present
Supervisor: Prof. S Feizi
 - Enhancing image editing capabilities in Text-to-Image Generative Models
 - Enhancing the compositional abilities of Text-to-Image Generative Models, specifically Diffusion Models
 - Exploring the interpretability of diffusion models and analysis of failure cases
- **École Polytechnique Fédérale de Lausanne (EPFL)** Lausanne, Switzerland
Research Assistant (Summer Internship) - Machine Learning and Signal Processing
July 2022 - June 2023
Supervisor: Prof. M Shoaran
 - Seizure detection using EEG recordings of brain activity and domain adaptation
- **Sharif University of Technology** Tehran, Iran
Research Assistant - Robustness in Deep Learning
Apr. 2021 - Jan. 2023
Supervisor: Prof. MH Rohban
 - Robust out-of-distribution detection
 - Improving adversarial training using data-centric approaches
- **University of Arizona** Arizona, United States
Research Assistant (Summer Internship) - 3D Vision
July 2021 - Sep. 2021
Supervisors: Prof. TL Swetnam, Prof. E Lyons
 - Lettuce soil point cloud segmentation

ACADEMIC SERVICES

- **Conference Reviewer**, ICLR 2024 - ICML 2024
- **Backend Lead**, [Sharif AI Challenge](#), Iran's Largest AI Competition 2021
 - Managed the entire software development lifecycle, including architecture, solution design, and maintenance.

SELECTED ACADEMIC PROJECTS

- **Image Generative Models - PyTorch Implementation from Scratch:** [source-code](#)
A PyTorch implementation (from scratch) of various image generative models — Diffusion Models, GANs, VAEs, and Autoregressive Models — with detailed explanations, visualizations, and key mathematical formulas for deeper understanding of the models.
- **Improve Seizure Detection using Adaptive Learning:** [source-code](#)
Designed and implemented pipelines for adaptive learning with tunable parameters concerning seizure detection using EEG signals (neural activities of brain) - Compared and analyzed the results of various models and methods - Developed tools to facilitate and accelerate the seizure detection procedure at different stages
- **3D Lettuce Soil Point Cloud Segmentation:** source-codes: [1](#) - [2](#) - [3](#)
Designed and implemented containerized (dockerized) pipelines for both annotating point clouds and training models for soil/lettuce point cloud segmentation - Developed tools to facilitate the aforementioned procedure at various stages
- **Selected Course Projects:**
Image Processing: [link](#) | Machine Learning: [link](#) | Modern Information Retrieval: [link](#) | Compiler Design: [link](#)
- **Others:** [Github](#)

WORK EXPERIENCE

- **Sotoon**
Software Engineer *Jan. 2022 - Apr. 2022*
 - A company providing Cloud and AI services
 - Project: Designed a Human Resource Management System
 - Technologies: Python, Django, Docker, HTML/CSS, Javascript, jQuery, Bootstrap
- **Snappfood**
Software Engineer *Aug. 2020 - Feb. 2021*
 - Leading online food ordering company in Iran
 - Back-End Developer in Menu Squad - Maintained menu APIs and designed new features
 - Technologies: PHP, Symfony, MySQL, Redis, Elasticsearch, Docker, RabbitMQ, HTML/CSS/Bootstrap, JS/jQuery

TEACHING ASSISTANT EXPERIENCE

- **Algorithms** *Fall 2023*
- **Machine Learning | Artificial Intelligence | Probability and Statistics** *Fall 2022*
- **Artificial Intelligence | Technical Presentation** *Spring 2022*
- **Artificial Intelligence | Design of Algorithms (2x)** *Fall/Spring 2021*
- **Compiler Design | Data Structures and Algorithms | Advanced Programming** *Fall/Spring 2020*

RELEVANT COURSEWORK

- | | |
|--|---|
| - Machine Learning: 20/20 | - Design of Algorithms: 20/20 |
| - Advanced Information Retrieval: 19.9/20 | - Image Processing: 19.4/20 |
| ★ Advanced Computer Graphics: 4.0/4.0 (A ⁺) | ★ Visual Learning and Recognition: 4.0/4.0 (A ⁺) |
| ★ Foundations of Deep Learning: 4.0/4.0 (A ⁺) | ★ Advanced Numerical Optimization: 4.0/4.0 (A ⁺) |
| ★ Multimodal Foundation Models: In Progress | ★ Natural Language Processing: In Progress |
| - Stanford CS229 - Machine Learning (online, audited) | |
| - Stanford CS231n - Deep Learning for Computer Vision (online, audited) | |
| - Generative Adversarial Networks (GANs) Specialization (Coursera) | |

TECHNICAL SKILLS

- | | |
|--|---|
| • Programming Languages: | Python, Java, C/C++, PHP, JavaScript, Golang |
| • Machine Learning Libraries: | PyTorch, NumPy, Diffusers, Transformers, OpenCV, Scikit-Learn, Pandas, ... |
| • Web Development & Database: | Laravel, Symfony, Django, NodeJS, ExpressJS, Wordpress, React, HTML/CSS, jQuery, Bootstrap, MySQL, Redis, MongoDB, Elasticsearch, RabbitMQ, ... |
| • Hardware Design: | Quartus, Arduino, Proteus, ModelSim, Verilog, MIPS Assembly |
| • Miscellaneous: | Docker, Git, Linux, |

HONORS AND AWARDS

- Ranked **1st** in different Front & Back Development Contests (by SnappTrip, CodeCup, Edalat-Khaneh)
- Ranked **2nd** in the Provincial Chess Tournament
- Ranked among the top 1% in the Nation-Wide University Entrance Exam

LANGUAGES

- **Persian:** native
- **English:** proficient (TOEFL 113: W30, S29, R27, L27)