

Arman Zarei

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EDUCATION

- **University of Maryland, College Park** Maryland, USA
Ph.D. in Computer Science - Advised by Prof. S. Feizi Aug. 2023 - Present
GPA: 4.0/4.0
- **Sharif University of Technology** Tehran, Iran
B.Sc. in Computer Engineering Sep. 2018 - Feb. 2023
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)
- **Shahid Soltani High School (NODET)** Karaj, Iran
Diploma in Mathematics and Physics Sep. 2014 - June 2018

RESEARCH INTERESTS

Generative Models, Image Synthesis, Multimodal Models, Computer Vision, 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
- **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 - ICLR 2025
- **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
- **Advanced Information Retrieval:** 19.9/20
- ★ **Advanced Computer Graphics:** 4.0/4.0 (A⁺)
- ★ **Foundations of Deep Learning:** 4.0/4.0 (A⁺)
- ★ **Multimodal Foundation Models:** In Progress
- **Stanford CS229 - Machine Learning** (online, audited)
- **Stanford CS231n - Deep Learning for Computer Vision** (online, audited)
- **Generative Adversarial Networks (GANs) Specialization** (Coursera)
- **Design of Algorithms:** 20/20
- **Image Processing:** 19.4/20
- ★ **Visual Learning and Recognition:** 4.0/4.0 (A⁺)
- ★ **Advanced Numerical Optimization:** 4.0/4.0 (A⁺)
- ★ **Natural Language Processing:** In Progress

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)