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Amir Hosein Haji Mohammad Rezaie

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Education

Bachelor of Computer Engineering **Aug 2020 - Jan 2025 (Expected)**
Sharif University of Technology, *Tehran, Iran*

- total GPA: 19.11/20 (3.97/4), Last 2 years' GPA: 19.46/20 (4/4)
- Advisor: Dr. Mahdieh Soleymani Baghshah
- Thesis: Understanding and Mitigating Spurious Correlation in Image Data

Publications

M. Azizmalayeri*, R. Abbasi*, **A. haji Mohammad rezaie***, R. Zohrabi*, M. Amiri*, M. T. Manzuri, M. H. Rohaban, "Spuriosity Rankings for Free: A Simple Framework for Last Layer Retraining Based on Object Detection", *ICML 2023 SCIS workshop*, 2023 (*equal contribution)

A. Rasekh, R. Heidari, **A. haji Mohammad rezaie**, P. Sharifi sedeh, Z. Ahmadi, P. Mitra, W. Nejdl. "Robust Fusion of Time Series and Image Data for Improved Multimodal Clinical Prediction" *IEEE Access Journal*, 2024.

Research & work Experience

Robust and Interpretable Machine Learning, Sharif University of Technology
Research assistant *Iran, Tehran*

- Supervisor(s): Dr. Mohammad Hossein Rohban - Mohammad Azizmalayeri

  - **Improving Robustness to spurious correlations in DNNs**: This work proposes a novel framework to identify spurious cues in images and choose a subset of dataset without spurious correlations to mitigate its effect on deep neural networks (DNNs) without human supervision.

L3S Research center **June 2023 - Present**
Research assistant *Hannover, Germany*

- Supervisor(s): Prof. Prasenjit Mitra - Dr. Zahra Ahmadi

  - **Multi-modal deep learning for healthcare applications**: This work presents a robust method for fusion of time series and image data in MIMIC-IV dataset to learn healthcare application tasks. Also, in this project I studied the diffusion-based classifiers to adopt them for healthcare prediction tasks in multi-modal setting.

Machine Learning Laboratory **Aug 2023 - Present**
Research assistant *Tehran, Iran*

- Supervisor: Dr. Mahdieh Soleymani Baghshah

  - **Developing Robust deep models againts spurious correlations via Interpretability methods (B.Sc. project)**: In this project, I present a new method to use interpretability methods like GradCAM to identify spurious last-layer features for each sample. In this way, we can mask-out spurious attributes to increase the worst-group accuracy by retraining last layer on new last-layer features without spurious cues.

Achievements

Gold Medal in National Astronomy and Astrophysics Olympiad summer 2019
Bronze Medal in International Astronomy and Astrophysics Olympiad summer 2020
Top 10% of Computer Engineering class of 2020 Spring 2024
Selected among the top 6 talents for merit-based AI graduate admission at Sharif University of Technology

selected courses

- Machine Learning: Deep learning, Machine learning, Artificial Intelligence, 3D Computer Vision
- Computer Science: Design Algorithms, Data Structures and Algorithm
- Mathematics: Probability & Statistics, Linear Algebra, Signals&Systems

TEACHING ASSISTANT EXPERIENCES

- Machine Learning: Deep generative models, Machine learning, Artificial Intelligence
- Computer Science: Design Algorithms, Data Structures and Algorithm
- Mathematics: Probability & Statistics, Linear Algebra, Signals&Systems

SELECTED PROJECTS

IMDb IR System **April 2024**

Advanced Information retrieval course project

Implemented IR system for IMDb data for different settings including learning-to-rank algorithms and RAG system. GitHub link

Signal Processing projects **June 2023**

Implementation of Interesting image and signal processing tasks in python. GitHub link

Machine Learning projects **November 2022**

Machine Learning projects: impelmentation of various ML models GitHub link

DDQN-Implementation **May 2022**

Artificial Intelligence course project

Implementation of Dual Deep Q-networks for playing ping-pong in Open-AI Gym. GitHub link

SKILLS

Programming	Python, C/C++, Java, R
ML tools	Pytorch, TensorFlow, Scikit-learn, Numpy, Pandas, Scipy
DBMS	MongoDB, PostgreSQL, MySQL
Communication	Persion (native), English: IELTS Academic overall:7.5 (L:7.5, R:9, W:7, S:6.5)
Miscellaneous	Git, LaTeX, Docker, Microsoft Office

REFERENCES

Prof. Prasenjit Mitra:
L3S Research center
email: mitra@l3s.de webpage: https://www.l3s.de/people/members/prasenjit-mitra/

Dr. Mohammad Hossein Rohban:
Sharif University of technology
email: rohban@sharif.edu webpage: https://sharif.ir/ rohban/

Dr. Mahdieh Soleymani Baghshah:
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Dr. Zahra Ahmadi:
Hannover Medical school
email: zahra.ahmadi@plri.de webpage: https://plri.de/team/zahra-ahmadi