Soroush Mahdi

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Statistical Data Analysis Laboratory-CEIT building-Amirkabir University of Technology-Hafez Ave-Tehran-Iran

Education

Master of Science in Artificial Intelligence — *Tehran, Iran*
AmirKabir University of Technology (Tehran Polytechnic) — *Sep 2020 – Present*
*Cumulative **GPA: 4/4** or 17.61/20.0*

Bachelor of Computer Engineering — *Hamedan, Iran*
Bu-Ali Sina University — *Sep 2016 – Sep 2020*
Cumulative GPA: 3.17 or 15.90/20.0

Research Interests

Adversarial Robustness
Trustworthy AI
Computational Neuroscience
Deep Learning Theory
Computer Vision
Generative AI

Honors & Awards

- **2_{nd}** Place in The National fNIRS Data Analysis Competition focusing on brain-computer interface systems to help patients with movement disorders, National Brain Mapping Laboratory, Tehran, Iran, 2022.
- Ranked **61_{st} Among More Than 15,000 Participants** in Iranian University Entrance Exam For Masters In Artificial Intelligence, Iran, 2020.
- Ranked **36_{th} Among More Than 15,000 Participants** in Iranian University Entrance Exam For Masters In Algorithms and Computation, Iran, 2020.
- Ranked **22_{nd}** Place in National Collegiate Scientific Olympiad in Computer Engineering, Iran National Organization of Educational Testing, Tehran, Iran, 2020.
- **1_{st}** Place in the Provincial Programming Contest of Hamedan, Hamedan University of Technology, Hamedan, Iran, 2019.
- **1_{st}** Place in 2017 & **2_{nd}** Place in 2019 Programming Contest, Iran West Region (WICPC). selected as a member of Bu-Ali Sina University's team for the West Asia Regional ACM-ICPC Contest as a result, Bu-Ali Sina University, Hamedan, Iran, 2019 & 2017.
- Ranked 14_{th} in the West Asia Regional ACM-ICPC Contest, Tehran, Iran, 2017

Publications

1. **Mahdi, S.**, Amirmazlaghani, M., "Adversarial training with memory", 2023. (in Preparation)

Research Experiences

Thesis Based M.Sc. Student and Research Assistant — *June 2021 – Present*
Statistical Data Analysis Laboratory — *Tehran, Iran*
Under the supervision of Maryam Amirmazlaghani

- Thesis title: An approach for improving the robustness of deep neural network image classifiers against adversarial examples
- Conducted a method for improving adversarial training by reusing generated attacks in previous epochs of training.
- Experimented with various loss functions, including TRADES and supervised contrastive learning losses.

Computer Vision Researcher — *Jan 2022 – Jan 2023*
HARA.ai — *Tehran, Iran*
Under the supervision of Ali Karimi

- Specialized in face anti-spoofing and liveness detection using deep learning techniques.
- Developed blink detection and blink counter models using semi-supervised approaches.

Academic Projects

- **Robust Supervised contrastive learning** - Github link
  Implemented adversarial training coupled with supervised contrastive learning using PyTorch.
- **PSO-SGD Hybrid Optimizer** - Github link
  Developed a custom PyTorch optimizer by designing an optimization algorithm that combines SGD and PSO.
- **multivariate HMM** - Github link
  Implemented a range of algorithms for Hidden Markov Models (HHMs) in the multivariate case from scratch.
- **Typicality-Based Collaborative Filtering Recommendation** - Github link
  Recommendation algorithm based on the paper "Typicality-Based Collaborative Filtering Recommendation".
- **Kohonen Self Organizing Map** - Github link
  Implemented Kohonen Self-Organizing Map (SOM) neural network from scratch utilizing NumPy.

Teaching Assistantships

Statistical Machine Learning - AmirKabir University of Technology — *Tehran, Iran*
Instructor: Maryam Amir mazlaghani (Assoc. Prof.) - Graduate Course — *Spring 2023*

Machine Vision - AmirKabir University of Technology — *Tehran, Iran*
Instructor: Reza Safabakhsh (Prof.) - Graduate Course — *Fall 2022*

Algorithm Design - Hamedan University of Technology — *Hamedan, Iran*
Instructor: Mir Hossein Dezfoulian (Asst. Prof.) - Undergraduate Course — *Spring 2020*

Other Undergraduate Courses: Artificial intelligence & Expert Systems(2019), Data Structures(2018), Discrete Structures(2017), Fundamental Of Computer Programming(2017)

Professional Skills

- **Programming Languages**:
  Python, C++, Matlab, R
- **Libraries/Frameworks**:
  PyTorch, NumPy, Pandas, OpenCV, scikit-learn, Tensorflow, JAX
- **Tools**:
  Git, LATEX, Visual Studio Code
- **Operating Systems**:
  Linux, Windows
- **Languages**:
  English: Fluent, TOEFL iBT to be taken in October
  Persian: Native

Major Courses

Machine Vision	19.9/20	**Stochastic Processes**	19.28/20
Machine Learning	18.6/20	**Neural Networks**	16.8/20
Optimization	16.21/20	**Computational Intelligence**	20/20

Refrences

Maryam Amir Mazlaghani (Assoc. Prof.)	mazlaghani@aut.ac.ir	Homepage
Mir Hossein Dezfoulian (Asst. Prof.)	dezfoulian@basu.ac.ir	Homepage
Ali Karimi (MSc)	aliiikarimi@ut.ac.ir	

More references are available upon request.