Ahmadreza Hadi

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Research Interests

Deep Learning: Reinforcement Learning, Generative Models, Multi-modal Learning
Reinforcement Learning: Application & Theory of RL, Online RL, MARL, Reliable Learning
Mathematics: Game Theory, Mechanism Design, Probability and Statistics, Linear Algebra

Education

2018 - present B.Sc. at **Isfahan University of Technology** (GPA: 15.7/20)
2014 - 2018 **National Organization for Development of Exceptional Talents** (GPA: 19.1/20)

Research Experience

Undergraduate Research Assistant Jan, 2023 – Present

Supervisor: Prof. Javadi

We are experimenting reinforcement learning (RL) techniques to solve combinatorial optimization problems (graph-based NP Problems) such as TSP. So far, We have conducted a literature review on graph encoding methods, reward assignments, different RL algorithms, and improvement vs. constructive techniques.

Undergraduate Research Assistant April, 2022 – Present

Supervisor: Prof. Heidarpour

I am working on utilizing Deep RL techniques for resource management and job scheduling. So far, I've implemented an environment to simulate the work of a cloud server. The agent should learn to choose optimal actions based on the servers' congestion, job length, and the delayed time between servers and clients. I implemented the environment and wrapped it with OpenAI's gym wrapper. Currently, I'm in the process of tuning the hyperparameters and modifying the architecture of the model to achieve optimal behavior in a complex environment.

Internship - Computational Intelligence Lab July, 2022 – Sep, 2022

Supervisor: Prof. Safayani

I worked on the infrastructure bring-up for students to utilize PyTorch and TensorBoard for conducting DL projects in the domains of face recognition and verification, GAN, and NLP.

Teaching Experience

Computational Intelligence Lab - *Under the supervision of Prof. Safayani* Spring, 2023

Applied Linear Algebra - *Under the supervision of Prof. Javadi* Fall, 2022

Compiler Design - *Under the supervision of Prof. Mansouri* Fall, 2021

Advanced Programming - *Under the supervision of Prof. Mansouri* Fall, 2021

Projects

Resource Management with Deep Reinforcement Learning [Code] 2022

Optimizing agent's behavior in an environment defined by *Resource Management with Deep Reinforcement Learning* with deep reinforcement learning techniques.

Deep Convolutional GAN with PyTorch [Code] 2022

Implementation of the Deep Convolutional GAN model using PyTorch on Celeba dataset and visualizing models and Losses with TensorBoard.

Breast Cancer Classification [Code] 2022

Final Data Mining project aimed to implement different ML and DL models to classify patients based on their features. MLP, Decision Tree, and Random Forest are some models used to classify patients in this project.

Recommender System Based on LightGCN 2021

Final Graph Mining project. Our goal was to utilize Graph Neural Networks (GNNs) to implement a recommender system based on the paper LightGCN to suggest movies based on the user's interests.

Skills

Programming Languages: Python, C/C++, Javascript, Matlab, Verilog
AI Related: PyTorch, TensorFlow, Keras, TensorBoard, Scikit-learn, Numpy, Pandas, OpenCV
Operating Systems: Linux (Ubuntu, Manjaro), Windows
Others: Git, LaTeX
Soft Skills: Problem Solving, Teamwork, Time Management

Honors & Awards

GRE Test - Scored 160 on Quantitative Reasoning and 3.5 on Analytical Writing 2022
Guest Lecturer at AICup - *Pathfinding Algorithms: Dijkstra and A** 2022
Ranked 2^{nd} at local ACM contest - Isfahan University of Technology 2019
Ranked among top 1% at Iranian University Entrance Exam 2018
Accepted at National Organization for Development of Exceptional Talents 2014

Selected Courses

Introduction to Information Theory - *Santa Fe Institute* ongoing
Introduction to Reinforcement Learning - *Deepmind* 2022
Reinforcement Learning in Python - *Udemy* 2022
Deep Learning Specialization - *Coursera-deeplearning.ai* 2021
Machine Learning - *Coursera-deeplearning.ai* 2020

University:

- Artificial Intelligence (4/4)
- Machine Learning (4/4)
- Neural Networks (4/4)
- Linear Algebra (4/4)
- Data Structures (4/4)
- Operating Systems (4/4)

Languages

Persian: Native
English: Advanced (TOEFL: 94/120, Taken on Nov, 12, 2022)

References

Dr. Mohammad Reza Heidarpour - Assistant Professor at Isfahan University of Technology
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Dr. Ramin Javadi - Associate Professor at Isfahan University of Technology
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Dr. Fatemeh Mansoori - Assistant Professor at Isfahan University
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