Parsa Haghighi

parsa.haghighi.n@gmail.com | parsa178.github.io | parsa-haghighi-b2156916b

Education

Sharif University of Technology *Tehran, Iran*

M.SC. IN ARTIFICIAL INTELLIGENCE *2021 - 2023*

- **Thesis Title:** "Improving video-text retrieval models using vision-language models" under supervision of Prof. Rabiee
- **Courses:** Machine Learning, Image Processing, Stochastic Process, Deep Learning, Natural Language Processing, Advanced Machine Learning, Advanced Digital Signal Processing

Isfahan University of Technology *Isfahan, Iran*

BACHELOR IN ELECTRICAL ENGINEERING *2016 - 2020*

- **Thesis Title:** "Generate fake data with Generative Adversarial Networks (GANs)" under supervision of Dr. Khosravifard **(Details)**

Research Interests

- Machine Learning
- Computer Vision
- Video Understanding
- Multi-modal Learning
- Medical Image Analysis
- 3D Imaging

Publications

A CLIP-Based Approach for Comparing Cross-modality and Unimodality in Visual Word Sense Disambiguation (Details)

Published in the Proceedings of the 17th International Workshop on Semantic Evaluation (SemEval-2023)

CLIPSampler: Distilling CLIP Knowledge to Train a Semantic-Aware Frame Sampler for Efficient Text-Video Retrieval (Details)

Under Preparation

Skills

Programming Languages	Python, Matlab, C#, C++
Machine Learning Frameworks	PyTorch, TensorFlow, Keras
Computer Vision Libraries	OpenCV, Dlib, scikit-image
Electrical Skills	FPGA-Verilog, AVR-Codevision, Cisco Packet Tracer, PLC step7
Language	Persian (Native), English (Advanced): TOEFL:94 (L:24, R:19, S:23, W:28)

Honors & Awards

- Ranked 4th in in the national university entrance exams for both M.Sc. degree in Computer Engineering and in Information Technology (IT).
- Ranked among top 1% in National-Wide University entry exam
- Receiving a full scholarship for both bachelor's and master's studies

Top Academic Projects

Image Processing

- Investigating the impact of different image enhancement methods on the CLIP model performance in a video understanding task **(Details)**
- Implementing various image processing techniques, such as Edge Detection, Image Segmentation, and Feature Matching.
- Implementing image enhancement methods, such as Histogram Equalization, Sharpening, and Template Matching.

Advanced Machine Learning

- Implementing various Meta-learning algorithms, including SNAIL, ProtoNet and MAML in PyTorch
- Training neural networks using a variety of Reinforcement Learning algorithms, such as DQN, HER, Model-based RL, PREAL and DREAM
- Implementing a range of Continual Learning algorithms, including notable methods like DEN, GEM

Machine Learning
- Implementing various classification models from scratch, such as kNN, decision tree and SVM
- Implementing clustering methods like k-means and GMM from scratch
- Developing RL methods like Q-learning and SARSA using PyTorch in Gym environment

Deep Learning
- Image classification using various models and Time series prediction using GRU and LSTM
- Training a pix2pix model to convert satellite photos into map style

Natural Language Processing
- Developing a tool for fast and efficient text-to-speech moment retrieval for finding related part in long audio files as final project **(Details)**
- Developing two Python-based tool for Persian language: Causal Relationships Extractor and Informal-to-formal Converter
- Utilizing various preprocessing tools and different word representation models, including Bag-of-words representation, TF-IDF and N-grams

Stochastic Processes
- Developing various algorithms in Python, including Point Processes and Hidden Markov Models (HMM).
- Implementing Monte Carlo Methods for Stochastic Simulation in Python.

Artificial Intelligence
- Training colorization and classification models using PyTorch on CIFAR-10
- Solving Sudoku using CSP algorithms, Othello using Alpha–beta pruning, and an Internet game using genetic algorithms.

Advanced Programming
- Designing a student education system using C# programming, including a user-friendly interface.

Industrial Automation
- Conducting a simulation of a production line using PLC, Step 7, and OPC and employing HMI to create an intuitive interface

FPGA (Verilog) Programming
- Calculating Fast Fourier Transform (FFT) of real-time signals and showing the results on an external monitor using VGA cable

Communication System
- Implementing a Matlab-based FM Receiver using SDR
- Designing a GUI platform to plot power spectral density (PSD) of FM signals using RTL-SDR

Experience

Teaching Assistance
- **Medical Image Processing** and **Reinforcement Learning** under supervision of Dr. Rohban
- **Stochastic Process** and **Linear Algebra** under supervision of Prof. Rabiee
- **Artificial Intelligence**, **Machine Learning** and **Deep Learning** under supervision of Dr. Soleymani
- **Deep Learning** under supervision of Dr. Beigy
- **C-Programming** under supervision of Dr. Naghsh

Research Assistance
- **Introducing a Geolocalized Middle East Food Image Dataset (Details)**
- Under supervision of Prof. Rabiee and Prof. Jain
- A joint project between Sharif University of Technology and University of California, Irvine

Extracurricular Experiences

Children of Heaven Charity
ISFAHAN UNIVERSITY OF TECHNOLOGY *Dec. 2017 - Dec. 2020*
- Served as Editor In Chief of Hiwa Magazine, dedicated to addressing and exploring social issues **(Details)**
- Engaged in teaching students in an underprivileged area of Isfahan city

IEEE Student Branch (Details)
ISFAHAN UNIVERSITY OF TECHNOLOGY *Jun. 2017 - Dec. 2020*
- Served as the Vice Chair
- Actively organizing educational courses, workshops, and technical events

Data Days 2022 competition (Details)
SHARIF UNIVERSITY OF TECHNOLOGY *Aug. 2022 - Oct. 2022*
- Contributed as a member of the science group.
- Presenting a Time Series Workshop for participants. **(Details)**