Parsa Haghighi Naeini

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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 the supervision of Prof. Rabiee
- **Courses:** Machine Learning (19.4/20), Image Processing (20/20), Deep Learning (18.3/20), Advanced Topics in Machine Learning (17.4/20), Stochastic Processes (16.5/20), Natural Language Processing (19.1/20), Advanced DSP (20/20)

Isfahan University of Technology *Isfahan, Iran*

BACHELOR IN ELECTRICAL ENGINEERING *2016 - 2020*

- **Final Project:** "Generate fake data with Generative Adversarial Networks (GANs)" under the supervision of Prof. Khosravifard **(Details)**

Research Interests

- Machine Learning
- Computer Vision
- Multimodal Learning
- Medical Image Computing
- Generative AI
- 3D Deep Learning
- Natural Language Processing

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

Experience

Teaching Assistance

- **Intelligent Analysis of Biomedical Images** and **Reinforcement Learning** under the supervision of Prof. Rohban
- **Artificial Intelligence**, **Machine Learning** and **Deep Learning** under the supervision of Prof. Soleymani
- **Stochastic Processes** and **Linear Algebra** under the supervision of Prof. Rabiee
- **Deep Learning** under the supervision of Prof. Beigy
- **Fundamentals of Computer Programming** under the supervision of Prof. Naghsh

Research Assistance

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

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 and GEM

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

Machine Learning

- Implementing Naive Bayes algorithm on a tabular dataset to classify spam emails, utilizing nltk library to preprocess texts
- Implementing various classification models from scratch, such as kNN, decision tree and SVM
- Implementing clustering methods like k-means and GMM from scratch

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 tools for Persian language: Causal Relationships Extractor and Informal-to-formal Converter

Stochastic Processes

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

Advanced Programming

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

FPGA (Verilog) Programming

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

Linear Algebra

- Implementing image compression using SVD and PCA methods in MATLAB
- Implementing various clustering methods like k-means in MATLAB.

Digital Signal Processing

- Comparing effect of quantization error on coefficients in direct- and cascade-based filters with MATLAB

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

Extracurricular Experiences

IEEE Student Branch (Details)

ISFAHAN UNIVERSITY OF TECHNOLOGY *Jun. 2017 - Dec. 2020*

- Served as Vice Chair
- Actively organizing educational courses, workshops, and technical events

Children of Heaven Charity

ISFAHAN UNIVERSITY OF TECHNOLOGY *Dec. 2017 - Dec. 2020*

- Served as Editor-In-Chief of a social magazine, dedicated to addressing and exploring social issues **(Details)**
- Engaged in teaching students in an underprivileged area of Isfahan city

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)**