Mahya Motamedi

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Education

Faculty of Engineering, University of Tehran — Tehran, Iran
B. Sc. in Engineering Science — September 2018- July 2023
Computer Engineering Branch — GPA: 3.32/4

Research Interests

- Computer Vision
- Deep Learning
- Image and Video Analysis
- Computational Neuroscience

Selected Courses

- Analysis and Design of Deep Neural Networks
- Introduction to Neural Networks
- Digital Image Processing
- Machine Learning
- Artificial Intelligence
- Database Systems
- Engineering Probability and Statistics
- Linear Algebra

Research Experience

Designing and Implementing a Novel Mix-Up Self-Supervised Algorithm November 2022- August 2023
Supervisor Dr. A. Kalhor

- Developed a novel self-supervised learning framework incorporating Mix-Up to improve model performance on low-contrast medical images.
- Created a dedicated loss function for image mixtures, leading to up to 3% improvement in top-1 accuracy across datasets.
- Trained the model to reconstruct the original image from a mixed version, forcing it to learn underlying structures.

Machine Learning and Deep Learning Model Development for Non-Invasive Blood Glucose Estimation
Supervisor Dr. H. Amiri

- Developed and implemented five ML and DL algorithms (SVR, MLP, RF, ANFIS, LightGBM) to estimate blood glucose levels using non-invasive wearable device data.
- Conducted comprehensive data preprocessing, feature engineering, and selection to enhance model accuracy and performance.
- Achieved superior predictive accuracy, identifying the best-performing model through rigorous evaluation using RMSE and MAE metrics.

Analysis of Mental Health, Medication Effects, and Cognitive Performance in Hospitalized Patients
Collaborator Data Scientist

- Analyzed test results of mental hospital patients, focusing on drug usage, mental state, hospitalization history, and cognitive task performance.
- Conducted comprehensive data analysis to evaluate the impact of medication on mental health and brain function.
- Collaborated with psychologists to assess cognitive performance and brain health, identifying patterns and correlations.

Selected Course Projects

Analysis and Design of Deep Neural Networks Course

- Calculate SI, maximize it using Subset selection in VAE and AE bottlenecks, and compare accuracy on CIFAR10 and Fashion-MNIST datasets. (Pytorch)
- Enhanced Triplet cost function performance using LFW dataset, optimizing distance metrics, reducing costs, and evaluating classifier accuracy. (Tensorflow)
- Optimized layer-wise training of an VGG11 network on CIFAR10, observing cost reduction, accuracy improvement, and SI trend. (Pytorch)

Digital Image Processing

- Simulated JPEG compression algorithm with quality parameters and compression rates, creating a user-friendly interface to display input and output images. (MATLAB)
- Created algorithms for noise removal, image sharpness assessment, and optimized photo selection among different focus levels. (Python)
- Explored methods and filters, including gamma correction, median, maximum, and minimum filters, along with parameter variations, to enhance image histograms and proposed improved solutions for medical image enhancement. (Python)

Introduction to Neural Networks

- Implemented CNN and efficient net transfer learning for "CIFAR-10" classification.
- Implemented YOLO-v5 for object detection.
- Implemented U-net and Deep Lab for image segmentation.
- Developed a text generation model with LSTM and GRU RNNs.
- Implemented BERT for hate speech detection.
- Implemented S-GAN, DC-GAN, Cycle-GAN, and VQ-VAE model for image generation.

Machine Learning and Artificial Intelligence

- Implemented ARIMA, AR, MA, and ARMA models for time series prediction.
- Applied PCA and K-means algorithms for data clustering on the "Breast cancer" dataset.
- Developed a genetic algorithm.
- Implemented search and CSP algorithms.
- Created a Blackjack game using adversarial search algorithms in Python.

Teaching Experience

- Teaching Assistant, Introduction to Artificial Intelligence — Instructor: Dr. H. Fadayi | Fall 2021
- Teaching Assistant, Machine Learning Algorithms — Instructor: Dr. A. Kamandi | Fall 2022

Work Experience

Machine Learning Engineer — Linom | August 2021 – August 2022

Linom is an online learning platform specializing in microlearning and personalization

- Introduced the Smart Speed System, with 55% of users consistently using the recommended speed.
- Applied personalized content recommendation, achieving a 35% conversion rate for recommended course purchases.
- Designed adaptive quizzes, enhancing users' proficiency in tackling tougher questions over time.
- Developed a leaderboard, engaging 80% of users and enhancing course interaction.

Technical Skills

Programming Languages
- Python (Expert)
- C++ (Proficient)
- C (Intermediate)
- Java (Intermediate)

Deep Learning Tools
- Tensorflow
- PyTorch
- Keras
- OpernCV

Databases
- MYSQL (Proficient)

Language Skills

English (Fluent) — TOEFL: 94 (Reading: 22, Listening: 30, Speaking: 21, Writing: 20)