SARA SOLTANI GERDEFARAMARZI

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EDUCATION

Isfahan University of Technology (IUT) *2019 - 2024*
Bachelor of Science in Computer Engineering
Overall GPA: 3.59/4.00 (17.19/20.00), (faculty average: 15.36/20)
Last two years GPA: 3.86/4.00 (18.26/20)

Hazrat Zahra Selective State High School *2016 - 2019*
High School Diploma in Mathematics and Physics
Overall GPA: 4.0/4.0 (19.88/20.00)

PUBLICATIONS

Published
Classification of ASD Based on fMRI Data Using Two Hybrid Learning Approaches
link to paper

Submitted
Improved Mother Optimization Algorithm- the complete ensemble empirical mode decomposition (CEEMD)-Kernel Extreme learning machine-Error correction strategy: A robust Predictive Model for Groundwater Level Prediction

TECHNICAL SKILLS

Python, C/C++/C#, SQL(PostgreSQL), SQLite, Verilog

Pytorch, Pytorch Geometric, torchvision, opencv, Tensorflow, Keras, Nilearn, Sklearn, Django, MATLAB

Machine Learning, Deep Learning, Computer Vision, Data Mining, Back-End Developing

PROJECTS

Predicting Progression From Mild Cognitive Impairment (MCI) to Alzheimer's Disease Using MRI Data
Github Repository

In this project, I aim to classify Alzheimer's disease stages using brain MRI images from the **ADNI** dataset. Initial experiments with CNN-based models, enhanced with attention mechanisms, achieved an accuracy of 78%. Additionally, I implemented a **ResNet-based** model with a **bias-aware pruning** technique, which reduced the model's reliance on spurious correlations and improved its generalization ability, reaching 97% classification accuracy. Moving forward, I plan to explore alternative bias reduction methods to further enhance model fairness and reliability.

Lung Disease Classification Using Chest X-ray Data
Github Repository

In this project, we aim to classify lung diseases using transformers and computer vision approaches. In this regard, I employed **Convnext, Internimage, and Swin transformers**. I plan to use a combination of CNNs and various transformers in the future for analyzing images both globally and locally.

Dog Cardiomegaly Assessment Using Dog X-ray Data
Github Repository

In this project, it is essential to first extract low-level and high-level features using various **transformers**. Then, we use convolutional layers to fuse these two features and predict 6 points coordinates in images (A, B, C, D, E, F). Then, we calculate VHS score = 6 * (AB + CD) / EF and classify each image into three classes according to the VHS value. MSE and BCE are used as training loss functions.

Classification For Loan Payment Prediction With Multiple Machine Learning Methods
Github Repository

First, the data were preprocessed and thoroughly analyzed using various methods including up-sampling to balance the data, handling null values and cleaning data, detecting outliers, data visualization, summary statistics, normalizing features, recategorizing categorical features, binning numerical features based on their effects on the correlations between features, and also mutual information between the features and target, extracting new features based on the combination of existing features. Then various types of models **(KNN, Naive Bayes, MLP, Decision Tree, Random Forest, XgBoost Classifier, SVM)** were trained on the data and tuned to properly handle over-fittings, under-fittings, and for finding the optimal hyperparameters for each model. Finally, the models that performed best on the validation set were chosen and the results were reported.

Diagnosing ASD Using fMRI Time Series Data with Graph Neural Netwok Approaches
Github Repository

In this project, to improve the classification accuracy of distinguishing individuals with autism from healthy individuals, **Graph Convolutional Neural Network** , **GraphSAGE** , and **SparseGAT** approaches were applied separately on the time-series fMRI data from several sites of the ABIDE data.

Back-End Development Of A Restaurant Website
Github Repository

In this project, the Back-End of a restaurant website was developed using the **Django** framework. This website consisted of functionalities including authentication, displaying the food menu, adding each food to the cart and finalizing or canceling the order, reserving the table on the desired date and time and canceling the reservation by users, automatically canceling the reservations with 30 minutes delay, implementing the different roles of garson, chef, and cashier, implementing the different webpages for each role according to their duties such as informing the garrisons to deliver the food or informing the chef to prepare the orders and handling takeaway orders.

Other Projects

Github Repository

- In this project, a simulated application for managing tasks related to a dental clinic, such as appointment scheduling for each dentist, as well as handling the clinic's financial matters, was implemented using **Windows Forms** in **C#**.

Github Repository
- In this project, a compiler for the Xlang language, which is a simple imperative language similar to C or Pascal, was implemented using **Flex** and **Bison** tools in **C++**. The compiler should handle **lexical analysis, syntax analysis, and semantic analysis** and then produce output code in assembly language.

SELECTED COURSE SCORES

Machine Learning	*20.0/20.0*
Data Mining	*17.0/20.0*
Data Structure	*20.0/20.0*
Algorithm Design	*18.4/20.0*
Signal Processing	*18.5/20.0*
Software Engineering II	*20.0/20.0*
Software Engineering I	*18.6/20.0*

LANGUAGES

Farsi: native or bilingual proficiency
English: Full Professional Proficiency
TOEFL iBT (Total Score): **98** Out of 120 (Reading: 23, Listening: 25, Speaking: 26, Writing: 24)

ONLINE CERTIFICATION

Supervised Machine Learning: Regression and Classification
Coursera

link to certificate

TEACHING EXPERIENCE

Teaching Assistant in the Fundamentals of Machine Learning Course
under the supervision of Dr. Mehran Safayani *February 2024 - June 2024*

Teaching Assistant in the Machine Learning Course
under the supervision of Dr. Niloufar Ahmadypour *February 2025 - June 2025*

HONORS AND AWARDS

Ranked 731 among more than 300000 high school students in the nation-wide university entrance examination, mathematics, and physics group *2019*

Admitted to a high-ranked university in Iran with a fully funded scholarship *2019*