SARA SOLTANI

Github ◇ LinkedIn
Phone: (+98) 9216429892 ◇ Email: soltanisara1380@gmail.com

EDUCATION

Isfahan University of Technology (IUT) *2019 - 2024*
Bachelor of Science in Computer Engineering
GPA: 3.59/4.00 (17.19/20.00)
last two years GPA: 3.86/4.00

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

THESIS

Hybrid Learning Approaches for Detection of Autism Spectrum Disorder Using fMRI Data
Supervisors: Dr. Hamidreza Hakimdavoodi

Github Repository

In this project, **three different models** were trained and tested on the **ABIDE** data to differentiate individuals with autism spectrum disorders from typical developing individuals.

At first, a machine learning model which is introduced in the paper (Eslami et al. (2019)), was used to overcome the low evaluation metrics obtained from traditional learning models. In continuation, two additional hybrid learning models were implemented in this regard.

To implement these two models, the **Extra-Trees** algorithm was initially used for dimensionality reduction and feature selection.

The second model, which was the simultaneous training of the **Deep Autoencoder** and a **SLP**, was implemented.

The third model, which consisted of a combination of the **GAN** and **Deep Autoencoder** structure to augment the data, was implemented to improve the performance of the **SVM** model.

Finally, an accuracy of 70.8% was achieved by examining different atlases.

PUBLICATIONS

Accepted for publication in IEEE Xplore
View Paper

Classification of ASD Based on fMRI Data Using Two Hybrid Learning Approaches

TECHNICAL SKILLS

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

Pytorch, Pytorch Geometric, torchvision, opencv, Tensorflow, Keras, stable_baselines3, gym,

Nilearn, Sklearn, Django, MATLAB

Machine Learning, Deep Learning, Computer Vision, Data Mining, Reinforcement Learning,

Back-End Developing

HONORS AND AWARDS

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

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

PROJECTS

Lung Disease Classification Using Chest X-ray Image
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 Image
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.

Brain Tumor Detection Using MRI Data
Github Repository

In this project, MRI images are first preprocessed using the OpenCV library. Then, the aim is to detect brain tumors using the YOLOv7 method. Additionally, other models such as CNN have been implemented as baselines to evaluate the performance of the YOLOv7 model.

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.

Diagnosing ASD Using fMRI Time Series Data with RL and Deep LSTM
Github Repository

In this project, to improve the classification accuracy of distinguishing individuals with autism from healthy individuals, **Deep Q-Network** and **Deep Long Short-Term Memory Neural Network** algorithms 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

show credential

TEACHING EXPERIENCE

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