Shakra Batool

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Research Interests Machine Learning, Deep Learning, Data Mining, Feature Extraction, Image Classification, Image Segmentation

Education

NUST University, Islamabad, Pakistan.

Masters of Bioinformatics — Sep. 2021 - Present

Relevant Courses: Applied Machine Learning, Data Annalysis and Statistics

COMSATS University, Islamabad, Pakistan.

Bachelors of Bioinformatics — Feb. 2017 - Jan. 2021

- **Thesis**: Breast Cancer Detection and Segmentation using Convolutional Neural Networks.
  Relevant Courses: Artificial Intelligence and Neural Networks, Bioinformatics Analysis, Deep Learning, Deep Learning in Medicine

Higher Secondary School Examination, Pre-Medical, June 2013 - May 2016

Work Experience

- **Undergraduate Student Researcher** — Sep. 2020 - Jan. 2021
  - National Center for Artificial Intelligence (NCAI)

Research Projects

- **Cancer Detection using Convolutional Neural Networks**
  Approach: I evaluated several CNN models including **VGG16**, **ResNet50**, and **MobileNet** to detect tumors from mammograms and histopathological images. For training and testing **CBIS-DDSM** dataset is used which is an updated and standardized version of the Digital Database for Screening Mammography (DDSM).
  Outcome: Trained MobileNet models which are able to accurately classify the tumor into benign and malignant classes
- **Cancer Segmentation using UNet**
  Approach: I used the UNet model for training on a publically available dataset namely Data Science Bowl 2018. Training dataset contains images along with the mask of nuclei present in images. To reduce overfitting, data augmentation is used.
  Outcome: A trained UNet model is able to segment the nuclei present in images.

Course Projects

- Auto diabetes detection using logistic regression on the microbiome of human body.
- Application of Linear Regression for age prediction.
- Identification and Extraction of specific human proteins using dictionaries and suffix trees.
- Restaurant Management System with online reservation system using Object Oriented Programming.
- **MUSINTO:** A game for kids to teach rhymes, alphabets, and numbers.

Languages and Tools

- **Languages:** Java, C++, Python, SQL, R, Matlab. I am also familiar with HTML, Visual Studio, C#, and FORTRAN.
- **Tools:** Eclipse, Idle, Google Colab, Netbeans, Visual Studio, MS SQL Server, XAMP.

Other Skills

- Machine learning models like Linear Regression, Logistic Regression, Decision Trees, Random Forest.
- Drug Designing by receptor-ligand binding using Bioinformatics Softwares including **Hex Software**, **Ligplot Plus**, **PDB Editor**,**Chimera**, and **Wincoot**, along with virtual screening using ML models.
- Study of DNA of different species using **NCBI**, **EBI**, and **SwissProt** .
- DNA to Proteins Conversions using Bioinformatics Tool **ExPasy**.
- Identifying Novel proteins and compare their sequences with other protein's sequences using **BLAST**, **FASTA**, **Rasmol**, **ClustalW**, and **Emboss**.
- **Microsoft Word**, **Microsoft Exel**, **Microsoft Powerponint**, **Microsoft Access**, **Linux** .

Volunteer Work

- Fund raising and distribution to local deserving people affected by COVID-19
- Awareness talk on Muscular Dystrophy and Thalasymia
- Hospital visit to understand the cause and effects of Muscular Dystrophy and Thalasymia in young children.