SHUBHAM JANGRA

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Education

M.Tech in Computational and Data Science　　　　　　**2023 – Present**
Indian Institute of Science, Bangalore　　　　　　　　*CGPA: 8.30/10*
A in Machine Learning for Data Science and Numerical Linear algebra

B.Tech in Mechanical Engineering　　　　　　　　　**2018 – 2022**
Punjab Engineering College, Chandigarh　　　　　　　*CGPA: 8.73/10*

Relevant Coursework

- Linear Algebra
- Probability and Statistics
- Mathematical methods for ML
- ML for Data Science
- DL and Computer Vision
- Random variates in computation

Internships

Graduate Engineer Trainee, TAFE Motors and Tractors Ltd.　　**Feb 2021 – May 2021**

- Inspected the Production Line for various Automobile Gear Manufacturing Processes.
- Worked on Gear deburring Machine and Chip Trolley Lifting System

Projects

U-Net and FCN for leaf disease dataset　　　　　　**Mar 2024**

- Implemented the Vanilla U-Net and Fully Convolution Network for semantic segmentation.
- Trained the Model from scratch on 1000+ images and evaluated the model on F1-score and Dice score.

Handwritten digit classification using the MNIST dataset　　**Jan 2024**

- Data preprocessing, model creation (both single-layer and multi-layer perceptron), training, evaluation, and visualization of training performance
- Neural network is trained on shuffled MNIST training data, and the final results are presented through accuracy metrics, a confusion matrix, and visualizations of actual versus predicted digit labels for a subset of test samples

Breast tumor malignancy using various classification models　　**Dec 2023**

- Involves data loading, data preprocessing, model training, and evaluation, providing accuracy scores for each model on a breast cancer dataset.
- Used Logistic Regression, K Nearest Neighbors, Support Vector Machines (SVM), and Multi-Layer Perceptron (MLP)

Dynamic Neural Network from Scratch　　　　　　**Dec 2023**

- The MLP is trained to perform a sum operation on a randomly generated dataset. with variable no. of layers and neurons.
- It employs forward and backward propagation methods for training with gradient descent to update the weights.
- The main section creates a dataset for the sum operation and initializes an MLP instance, trains the network, and evaluates its performance on a dummy data point.

Academic Assignments

- Performed Image Compression using **Singular Value Decomposition (SVD).**
- Performed Sinusoidal Regression with **QR factorization** (Gram-Schmidt, Modified Gram-Schmidt, Householder Reflection) and **Normal Equation** from scratch.
- Computed **Page rank** using **Power Iteration from the Markov Transition Matrix** of the given graph.

Technical Skills

Programming Languages: Python, C++
Tools: TensorFlow, PyTorch, Numpy, Sci-kit Learn, Pandas, MatplotLib
Technical: Machine Learning, Optimization, Deep Learning

Academic Accomplishments

- Secured All India Rank 105 in GATE ME 2023.