Divyaansh Mertia

Roll No.:M23CSE013
M.Tech
Computer Science and Engineering
Indian Institute Of Technology, Jodhpur

+91-7014535157
divyaanshmertia@gmail.com
m23cse013@iitj.ac.in
Github
linkedin.com/in/divyaansh-mertia

Education

Degree/Certificate	Institute	CGPA/Percentage	Year
M.Tech. (CSE)	Indian Institute of Technology, Jodhpur	7.2	2023-Present
B.Tech. (CSE)	Jodhpur Institute of Engineering and Technology	8.91	2019-2023

Internship, Leadership And Training Experience

- **Celebal Technologies** *June 2022 - July. 2022*
  Celebal Summer Intern Jaipur
  – Worked in App-development as a back-end developer with Node.js.
  – Created various REST API to perform CRUD operations and filtering of data.
  – Created a detailed Swagger Documentation. deployed the project using Heroku.

- **Cipher Schools** *Summer 2021*
  Full Stack Developer Trainee
  – Developed web app using MERN Stack.
  – Made website mobile-friendly.

- **IIT Bombay** *Fall 2019*
  Digital Marketing Intern
  – Digital Marketing Intern for Mood Indigo (Asia's Largest Cultural Fest), IIT Bombay.

Projects

- **Neural Network Implementation for Fashion MNIST Classification** *Nov 2023*
  Developing a neural network from scratch for classifying the Fashion MNIST dataset. Colab
  – Created a Python-based neural network with three hidden layers for multi-class classification.
  – Implemented He initialization for weight parameters and used sigmoid and softmax activation functions.
  – Applied backpropagation with gradient descent, L2 regularization, and early stopping for effective training.
  – Trained the model for 25 epochs using a mini-batch approach.
  – Conducted training with train-test splits of 70:30, 80:20, and 90:10. Achieved accuracies of 78.87%, 78.71%, and 81.5% with early stopping and regularization, respectively.
  – Without early stopping and regularization, the accuracies improved to 84.03%, 85%, and 86.2% for the respective splits.

- **E-Voting System with Facial Recognition** *Nov. 2023*
  A web app for e-voting by and using facial recognition as a biometric authentication mechanism. Github
  – Developed responsive front-end using HTML, CSS, JavaScript, and Bootstrap.
  – Integrated a sophisticated facial recognition system for voter authentication, mitigating identity fraud.
  – Implemented backend services in Python with Flask, including RESTful APIs.
  – Utilized MySQL (Google Cloud SQL) for robust database management and SQLAlchemy for database operations.
  – Stored sensitive data like images in Google Cloud Storage, ensuring data security and scalability.

- **In-Depth Analysis of PCA, K-Means, and GMM Clustering on MNIST in Python** *Oct. 2023*
  Extensive exploration of data clustering techniques, focusing on PCA, K-Means, and GMM. Github
  – Implemented K-Means clustering from scratch with Cosine Similarity as the distance metric.
  – Developed an optimal cluster selection function.
  – Implemented Principal Component Analysis (PCA) from scratch to reduce the dimensionality of MNIST.
  – Subsequently, performed GMM clustering.
  – Utilized explained variance ratios to determine the ideal number of PCA components.
  – Conducted a thoughtful analysis of cluster characteristics and drew comparisons with K-Means clustering results.

- **Building a Peer-to-Peer (P2P) System** *Sept. 2023*
  Design and implementation of a decentralized file-sharing P2P system using Python. Github
  – Engineered a P2P system with multiple peer nodes, each with a file index, network layer, and neighbors list.
  – Utilized Python and Tkinter for GUI, with modules like threading, socket, os, and json for network operations.
  – Implemented features like decentralized file sharing, status updates, and connection handling through multi-threading.
  – Addressed challenges of scalability in P2P networks and proposed improvement strategies like Distributed Hash Tables (DHT), caching, and load balancing.

- **Trinetra: Eye of The Community** *Feb. 2023*
  Developed a decentralized android app to facilitate crime reporting in users' vicinity. Github
  – The app relies on upvoting and downvoting of incidents to determine the level of urgency and spread the word to nearby devices.
  – As users' reputation points are impacted by their contributions, Trinetra encourages a sense of community involvement and responsibility.
  – **Tools & technologies used**: Java, Firebase Real-time database and Firebase storage, Maps API, Geo Fencing

- **Book My Show System From Scratch Using MERN Stack** *June. 2021*
  A clone of a popular movie booking website. Github
  – Using React.js and showcased the use of Function components, hooks, props and integrated API's with front-end.
  – Using Node.js and Express.js created various REST API's and connected Node app to Database.
  – Using MongoDB implemented collections for movie, user and theater details. For Security Used JSON web Tokens.

Key Courses Taken

- Computer Vision, Deep Learning, Machine Learning, Artificial Intelligence, Software and Data Engineering.

Technical Skills

- **Programming:** Python, Java, C/C++, JavaScript, SQL
- **Web Technologies:** Flask, Bootstrap, SQLAlchemy, React.js, Node.js, Express.js, CSS, HTML
- **IDE's/Tools:** Git, IntelliJ Idea, Vs Code, Sublime Text, Android Studio

Achievements

- **Award For Best Delegate** Model United Nations, JIET(Annual Fest) *March. 2023*
- **Third Prize** National Science Week 2022 Technical Presentation *Feb. 2022*

Certifications

- NPTEL Elite Certification on Design And Analysis Of Algorithms
- NPTEL Certification on Database Management System
- NPTEL Elite Certification Introduction To Internet Of Things