Vishal Singhania

singhaniav.github.io | +91-7782874447 | vishsinghania@outlook.com

EDUCATION

Manipal University Jaipur
Faculty of Engineering
BTech in Computer and Communication Engineering
Minor in Data Science
July 2024 | Jaipur, Rajasthan
Cum. GPA: 8.87 / 10.0 (till 6th Sem)

SKILLS

Programming & Scripting
C • C++ • Python • Bash • SQL
R • MATLAB • Java

Tools & Frameworks
Backend Development:
Git • Linux • Flask • FastAPI
Docker • PostgreSQL • MongoDB
Data Science & Machine Learning:
SciPy • Pandas • NumPy • NLTK
Matplotlib • scikit-learn • TensorFlow

COURSEWORK

Undergraduate
Design & Analysis of Algorithms
Data Structures & Algorithms
Object Oriented Programming
Operating Systems
Database Systems
Computer Networks
Artificial Intelligence
Data Mining & Warehousing
Neural Networks & Deep Learning*
Big Data Analytics*
Information Retrieval*
Blockchain Technologies*
Probability & Statistics
Discrete Mathematics
*(*to be completed by Dec 2023)*

OpenCourseWare
Graph Algorithms *by UCSD*
CCNAv7: Intro to Networks *by Cisco*
Programming in Python *by Python Institute*
C++ Specialization *by UIUC*

LINKS

Competetive Programming
CodeChef/big_v • Codeforces/BigV_
Topcoder/BigV_ • AtCoder/BigV

Profiles
Github/SinghaniaV • Leetcode/bigV_
Kaggle/bigvish • LinkedIn/singhaniav

PROJECTS

WatsonX — Natural Language Processing + Information Retrieval
NLTK | Python
- Built a question answering system similar to IBM Watson. It operates on a corpus of text documents and aims to find the most relevant documents and passages to a given query.
- For document retrieval, the system uses **tf-idf (term frequency-inverse document frequency)** to rank them based on the frequency of query terms and their overall importance in the corpus.
- Passage retrieval is performed by subdividing the top document(s) into sentences. In scoring the passages, the system employs a combination of **inverse document frequency** and a **query term density** measure.

NimStrategist — Reinforcement Learning
Python
- Nim is a game where players take turns removing objects from piles, and the player who removes the last object loses.
- Developed an AI that gradually learns the optimal actions to take in different game states through **reinforcement learning**, specifically using **Q-learning**.
- The Q-learning formula is used to update the Q-value for each (state, action) pair using the learning rate (alpha), which determines the weight given to new information, and the estimation of the current and future rewards.

ShopSense — Classification + Machine Learning
scikit-learn | Python
- Built a **nearest-neighbor** classifier to determine whether the visitor is likely to make a purchase on an online shopping website or not. The model was based on this paper - *Real-time prediction of online shoppers' purchasing intention using multilayer perceptron and LSTM recurrent neural networks.*
- To evaluate the accuracy of the classifier, two metrics were used: **sensitivity** (true positive rate) and **specificity** (true negative rate).
- By using the model, one can predict a user's purchasing intent and make informed decisions, such as displaying different content or offering discounts.

Nand2Tetris — Operating Systems + Compilers + Architecture
HDL | Assembly | C
- Following the guidelines at Nand2Tetris, implemented a fully functional computer from scratch (**software hierarchy** + **hardware platform**).
- The hardware platform involves implementing the **elementary logic gates** using an **HDL**. Then, a **CPU**, and a **RAM** chip from combinational & sequential logic.
- The software hierarchy involves implementing a **high-level language**, a **compiler**, a **Virtual Machine translator** to translate the compiled code to machine language, then an **assembler** to translate it to binary, and finally, a basic **operating system** that closes gaps between the high-level language and the underlying hardware platform.

ACHIEVEMENTS

2023	**3 star (Div. 2)**	Peak **rating of 1630** on CodeChef
2023	**India Rank of 4944**	Google's **Code Jam** Round A
2023	**Global Rank of 293**	CodeChef Starters 75
2022	**Global Rank of 946**	Codeathon organized by IIT BBS
2022	**Qualified Round 1**	ACM Semi Code (an Institute level Codeathon)
2023	**Contributor**	Kaggle (a data science competition platform)