

Vishal Singhanian

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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 • Java • R • \LaTeX
MATLAB • Shell (Bash/PowerShell)

TOOLS & FRAMEWORKS

Backend Development:

Git • Linux • Flask • Docker
MySQL

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

COMPETITIVE PROGRAMMING

CodeChef/[big_v](#) • Codeforces/[BigV_](#)
Topcoder/[BigV_](#) • AtCoder/[BigV](#)

PROFILES

Github/[SinghanianV](#) • Leetcode/[bigV_](#)
Kaggle/[bigvish](#) • LinkedIn/[singhaniav](#)

PROJECTS

WATSONX

NLTK | Python

NATURAL LANGUAGE PROCESSING + INFORMATION RETRIEVAL

- 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

Python

REINFORCEMENT LEARNING

- **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

scikit-learn | Python

CLASSIFICATION + MACHINE LEARNING

- 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

HDL | Assembly | C

OPERATING SYSTEMS + COMPILERS + ARCHITECTURE

- 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)**
2023 **India Rank of 4944**
2023 **Global Rank of 293**
2022 **Global Rank of 946**
2022 **Qualified Round 1**
2023 **Contributor**

Peak **rating of 1630** on CodeChef
Google's **Code Jam** Round A
CodeChef Starters 75
Codeathon organized by IIT BBS
ACM Semi Code (an Institute level Codeathon)
Kaggle (a data science competition platform)