

# Vishal Singhanian

[singhaniav.github.io](https://singhaniav.github.io) | +91-7782874447 | [vishsinghanian@outlook.com](mailto:vishsinghanian@outlook.com)

## EDUCATION

### MANIPAL UNIVERSITY JAIPUR

Faculty of Engineering  
BTECH IN COMPUTER &  
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  
Data Mining & Warehousing  
Artificial Intelligence & 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

### WATSON X

#### 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.

### NIM STRATEGIST

#### 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.

### SHOP SENSE

#### 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.

### NAND 2 TETRIS

#### 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)**  
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)