	Hardik Siloiya	190050047
	Computer Science & Engineering	**B.Tech.**
	Indian Institute of Technology Bombay	**Gender: Male**
		DOB: 23/10/2001

Examination	University	Institute	Year	CPI / %
Graduation	IIT Bombay	IIT Bombay	2023	8.36
Intermediate	CBSE	Delhi Public School, Nerul	2019	96.80%
Matriculation	ICSE	Ryan International School, Kharghar	2017	96.60%

Pursuing **Honors** in **Computer Science and Engineering**

SCHOLASTIC ACHIEVEMENTS

- Secured **99.8% percentile** in **JEE Main** out of **1.4 million** candidates *(2019)*
- Secured **99.1% percentile** in **JEE Advanced** (IIT-JEE) out of **240,000** candidates *(2019)*
- Received Certificate of Merit for being among the **top 0.1%** candidates in **Chemistry** and **Computer Science** in the **All India Senior School Certificate Examination** (AISSCE) *(2019)*
- Secured **International Rank 207** in **International Science Olympiad** conducted by SOF *(2018)*

INTERNSHIPS

Customer Emotion Detection Chatbot *(Summer 2022)*
Wells Fargo | Software Engineering Intern
Offered ***Pre-Placement Offer*** *for exemplary performance throughout the internship*

- Deployed a real time emotion detection chatbot obtaining an accuracy of 95% using **fine-tuning** the BERT model
- Implemented a **low-latency suggestion generator** in the chatbot using **heuristic algorithms** on queries and **ML models** to give real-time suggestions to executives from a dictionary
- Implemented a **feedback loop** allowing customers to rate messages, facilitating **active learning** of neural network

Web Scraping using Computer Vision *(Summer 2021)*
MindWorks Global | Data Scientist Intern

- Implemented a **Faster RCNN** based object detection framework via Detectron2, and **fine-tuned** it for accurate detection of headline and body in images of news articles, obtaining a **mAP** of 90%
- Used the **Tesseract Optical Character Recognition model** to **obtain the textual information** from the the objects detected by Faster RCNN
- Used **HTML heuristics to accurately get the dates** of the web articles from their links

RESEARCH EXPERIENCE

Exact algorithms for 5-Graph coloring *(Ongoing)*
Guide: Prof. Sundar Vishwanathan | R&D Project IIT Bombay

- Researching on designing **exact algorithms** which work efficiently on **NP-hard** problem of **5-coloring** in graphs

Finding Grundy Numbers for Two level Poset Games *(Ongoing)*
Guide: Prof. Rohit Gurjar | B.Tech. Project IIT Bombay

- Researching on developing efficient algorithms for computing **Grundy Numbers** for general two level **Poset games** and adapting them to solve similar **impartial games**

Self-Stabilizing algorithm for Grid Architecture *(Spring 2022)*
Guide: Prof. Rushikesh Joshi | R&D Project IIT Bombay

- Developed an algorithm for **stabilizing a distributed system** in the form of a **grid network**, achieving **fault recovery** from arbitrary state and converging in quadratic order using **mutual exclusion**

Animal Detection in videos *(Summer 2021)*
Guide: Prof. Prabhu Ramachandran | Student Undergraduate Research Project IIT Bombay

- Built an **object detection framework** for accurate detection of animal species in videos
- Implemented the feature of **adding multiple classes to an existing model**, with only retraining the model on a **subset of the previous data** using **Active Learning**

OTHER PROJECTS

SCLP: Compiler for C-like language *(Spring 2022)*
Prof. Uday Khedkar | Course Project IIT Bombay

- Developed a **compiler and interpreter** for subset of C supporting functions, scope levels and control sequences
- Used **Lex** for tokenizing, **Yacc** for parsing and **constructed ASTs** to **generate MIPS assembly code**

Online Development Environment (ODE) *(Autumn 2020)*
Prof. Amitabha Sanyal | Course Project IIT Bombay
- Developed an **online development platform** with an **isolated environment** supporting User Registration and Code saving APIs using a **code directory** storage system
- Used **Django and SQL databases** for efficient and secure management of user data
- Implemented **compiler support** for **C++, python, and Java** including their library support

Multi Cycle Processor, IITB-Proc *(Spring 2021)*
Prof. Virendra Singh | Course Project IIT Bombay
- Designed a **16-bit architecture**, having a **point-to-point communication infrastructure** in **VHDL**
- Implemented an architecture that supports **predicated instruction execution**, **ALU operations**, and **multiple load and store executions**

Covid Analyzer *(Spring 2022)*
Prof. Umesh Bellur | Course Project IIT Bombay
- Developed a react application which allows users to **view and compare** various **covid statistics** from countries around the world by querying data from a **time series database** using **influxQL**
- Implemented **user groups** giving access to certain users to add data into the database and global data

Generative Models *(Summer 2021)*
Self Project
- Implemented several generative models including **RNN** for music generation, Chatbot using a **LSTM network**, **CycleGANs** for image translation, and **Variational Autoencoder** for image compression and restoration
- Implemented **MuseGAN** using **Wasserstein GAN framework** with gradient penalty loss for **generating multi-track 2-bar songs**, with each bar having 16 time instances

Quad Tree *(Autumn 2020)*
Prof. Ajit A. Diwan | Course Project IIT Bombay
- Implemented the **quad tree** data structure used for **efficiently storing sparse binary matrices** allowing compression of such images and matrices with functions to perform **binary operations** such as XOR, AND, OR

Image Splicing Detection *(Autumn 2021)*
Prof. Ajit Rajwade | Course Project IIT Bombay
- Implemented a technique to **identify tampered images** leveraging inconsistencies in **local noise variance**

Data Science *(Summer 2021)*
Maths & Physics Club | Summer of Science IIT Bombay
- Undertook a detailed study on the various **Machine Learning algorithms** and investigated various practices for **extracting information from structured and unstructured data**
- Drafted a report on various Machine Learning algorithms for Data science and methods for data manipulation, and gave a presentation on **Kernel Methods**

Reinforcement Learning *(Autumn 2021)*
Prof. Shivaram Kalyanakrishnan | Course Project IIT Bombay
- Implemented algorithms for sampling the arms of **stochastic multi-armed bandit** including **UCB** and **KL-UCB**
- Implemented a **MDP solver** which finds the optimal policy from any state for **Anti-Tic-Tac-toe**

TECHNICAL SKILLS

Programming Languages	C++, Python, C, Bash, Java, Sed, Awk, BASIC, VHDL
Web Development	HTML5, CSS, JavaScript, Django, React, Angular
Software Skills	Git, MATLAB, LaTeX, MySQL, AutoCAD, Quartus, Android Studio

KEY COURSES UNDERTAKEN

Computer Science	Database Systems and Lab, Automata Theory, Compilers and Lab, Discrete Structures, Computer Architecture and Lab, Operating Systems and Lab, Artificial Intelligence & Machine Learning and Lab, Software Systems Lab, Design and Analysis of Algorithms, Logic for Computer Science, Computer Networks and Lab
Mathematics	Calculus, Linear Algebra, Differential Equations, Numerical Analysis

EXTRACURRICULARS

- Participated in the **Social Service Camp** conducted by Ryan Group of Institutions held at Daman *(2017)*
- Successfully completed one year of **Guitar training** under **National Sports Organization** *(2019)*
- Received a special mention in **Video-Making Competition** organised by Culturals, IIT Bombay *(2019)*
- Hobbies: **Competitive Programming**, playing **guitar**, **E-Sports** and watching **anime**