Hardik Siloiya

Computer Science & Engineering

Indian Institute of Technology, Bombay

190050047

B.Tech.

Gender: Male

DOB: 23-10-2001

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

Pursuing **Honours** 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)*

INTERNSHIPS

Mindworks Global *(Summer 2021)*

Data Scientist Intern *Remote*

- 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 **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.

IMPORTANT PROJECTS

Animal Detection in videos *(Ongoing)*

Prof. Prabhu Ramachandran | Student Undergraduate Research Project *IIT Bombay*

- Building an **object detection framework** for accurate detection of animal species in images and videos.
- Implementing the feature of **adding multiple classes to an existing model without retraining the model** on the previous classes using **Active Learning**.

Generative Models *(Summer 2021)*

Self Project

- Implemented several generative models including **RNN** for music generation, Chatbot using a **LSTM network**, **CycleGANs** for image translation, **Style Transfer Net** 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.

ACADEMIC PROJECTS

Multi Cycle Processor, IITB-Proc *(Spring 2021)*

Prof. Virendra Singh | Digital Logic Design *IIT Bombay*

- Designed a **8-register, 16-bit computer system**, having a **point-to-point communication infrastructure** in VHDL.
- Implemented the architecture that supports **predicated instruction execution**, **ALU operations**, and **multiple load and store executions**.

Online Development Environment (ODE) *(Autumn 2020)*

Prof. Amitabha Sanyal | Software & Systems Lab *IIT Bombay*

- Implemented 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.

Quad Tree *(Autumn 2020)*
Prof. Ajit A. Diwan | Data Structures And Algorithms IIT Bombay
- Implemented the **quad tree** data structure used for **efficiently storing sparse binary matrices**.
- Implemented functions for setting the pixel values, and binary operations such as XOR, AND, OR of quad trees.
- Implemented algorithms for efficient **compression** of such images and matrices.

Morphism: An Abstract Data Type *(Autumn 2020)*
Prof. Ajit A. Diwan | Data Structures and Algorithms IIT Bombay
- Investigated the attributes of morphism objects, such as **Fibonacci** and **Thue-Morse morphisms**.
- Implemented an abstract datatype by defining composition and concatenation for the objects.
- Implemented **Dynamic Programming** to search characters in a target pattern for better time efficiency.
- Investigated generic properties using a **mappings-tree representation**, accounting for **recurrence relations** and **hierarchies**, to find the shortest target pattern with a given substring or subsequence.

OTHER PROJECTS

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**.

Food Recommendation using Machine Learning *(Summer 2020)*
Web and Coding Club | Summer of Code IIT Bombay
- Developed a **web app** for recommendation of recipes based on preferences.
- Implemented **back end** with **Django framework**, giving basic Registration, Login and Profile Edit APIs, to be integrated into front end.

TECHNICAL SKILLS

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

COURSES UNDERTAKEN

Computer Science	Data Structures and Algorithms, Discrete Structures, Computer Architecture and Lab*, Operating Systems and Lab*, Artificial Intelligence & Machine Learning and Lab*, Learning over Graphs*, Fundamentals of Image Processing*, Foundations of Intelligent and Learning Agents*, Data Analysis and Interpretation, Software Systems Lab, Digital Logic Design and Lab, Design and Analysis of Algorithms, Logic for Computer Science, Computer Networks and Lab, Abstractions and Paradigms in Programming, Computer Programming and Utilization
Mathematics	Calculus, Linear Algebra, Differential Equations
Others	Psychology*, Quantum Physics and Application, Basics of Electricity and Magnetism, Engineering Graphics and Drawing, Physical Chemistry, Organic and Inorganic Chemistry, Biology, Introduction to Electrical and Electronics Circuits, Economics

ongoing, to be completed by November 2021

EXTRACURRICULARS

- Participated in the **Social Service Camp** conducted by Ryan Group of Institutions held at Daman. *(2017)*
- Participated in the **International Children's Festival of Performing Arts** consisting of participants from over 45 countries. *(2012)*
- Successfully completed one year as a **Guitar player** under **National Sports Organization**. *(2019)*
- Received a special mention in **Video-Making Competition** in **Freshizza** organised by Culturals IIT, Bombay. *(2019)*