Samyak Sanghvi

samyakssanghvi@gmail.com | samyak-sanghvi-519221282 | SamyakSS83 | +91 9890822695

Education

Indian Institute of Technology, Delhi, B.Tech. in Computer Science and Engineering — **Delhi, India**
July 2023 - Present — CGPA: **9.37/10.0**

Alpha Junior College for Science and Commerce, Class XII HSC — **Mumbai, India**
March 2023 — Percentage: **92.0%**

Kilbil St. Joseph's High School, Class X SSC — **Nashik, India**
March 2021 — Percentage: **93.2%**

Awards and Honours

- Ranked **18th** out of 155 in the Computer Science Department, Indian Institute of Technology, Delhi
- Was among the **top 7%** of my batch, at the end of the first year, based on CGPA criteria
- Awarded **Best UG Live Demo** in Open House IITD 2024 among over 300 presentations.
- Secured All India Rank **83** in **JEE Advanced 2023** amongst 180372 candidates
- Secured All India Rank **384** and a percentile score of **99.97** in **JEE Main 2023** amongst 1.14 million candidates
- Selected for **Orientation-cum-Selection Camp** for International Physics Olympiad 2023 held at HBCSE, Mumbai
- Received **Gold medal** for being among the **top 35** students in **Indian National Chemistry Olympiad 2023**
- Selected for national team of **Asian Physics Olympiad 2023** Mangolia
- Awarded the prestigious **KVPY Fellowship** in 2021-22 with All India Rank of **27** out of 50000
- Ranked among **top 1%** in **National Standard Examination in Chemistry** (precursor to IChO)
- Ranked among **top 1%** in **National Standard Examination in Astronomy** (precursor to IOAA)
- Ranked among **top 1%** in **National Standard Examination in Junior Science** (precursor to IJS0)
- **Winner** of Experimental, Theoretical and Computational Chemistry competition Chemenigma 2024 by IISC Banglore

Project Experience

5 Degree of Freedom FDM Printer — April 2024 - Ongoing
Prof. Sagar Sarkar, Indian Institute of Technology, Delhi — *Research Project*

- Created a pipeline to achieve graphics based multi-axis adaptive slicing to allow support-less overhang printing
- Designed and implemented a method to identify, label and segment extrusions using tessellation-based mesh.
- Designed a fault detection interrupt pipeline and implemented a 2D to 3D point cloud reconstruction algorithm

Monocular Reconstruction and Localization — October 2024 - Ongoing
Robotics Club, Indian Institute of Technology, Delhi

- Designed and Implemented a Pipeline for segmentation and object localization in 3D for trajectory monitoring
- Used SAM2 to segment and mask part(s) to be monitored in video feed from multiple synchronous cameras
- Used modified NeRF to sample images and reconstruct a point cloud for each instant from the segmented video.

Co-Inventor of Portable Bio-metric Attendance System — May 2024 - Ongoing
Deployed in the Multiple Departments and Hostels

- Implemented a custom lightweight operating system for the device, supporting WiFi, Sensor and RTC.
- Integrated cloud access to securely store and manage attendance data, ensuring availability and scalability.
- Designed custom drivers for the fingerprint sensor and RTC to be compatible with the ESP32.

Fake Resume Detection in a Batch — October 2024
Innov8.0 Challenge

- Performed coherence analysis across sections in resumes and letters of recommendation to evaluate alignment.
- Implemented consistency checks to assign scores to individuals based on detected anomalies and deviations.
- Modelled the batch as a graph, used community detection algorithms to identify clusters and propagated scores.

20 Questions with a PC January 2025

Automated Game for Literature-based Fest

- Designed and Implemented a RAG pipeline using LLAMA3 for participants to query and question to guess the book.
- Implemented a minimalistic UI for participants to access the agent and hosted the website on organizers' PCs

Implemented Attention is all you need November 2024 - January 2025

Self-Learning Project

- Implemented and recreated the transformer architecture from the "Attention Is All You Need" paper using PyTorch.
- With the main focus on self-attention mechanisms tried optimizing and tackling vanishing and exploding gradients

Autonomous Robotics Development January 2024 - July 2024

Part of the IITD Robocon Team

- Made a fully autonomous robot capable of detecting and localizing balls and stands using OpenCV and YOLOv10
- Developed a navigation system for controlling motion and odometry using a PID based on using computer vision

Quadcopter Control despite Motor Failure November 2024-December 2024

Inter-IIT Aerial Robotics Problem Statement

- Designed a simulation environment for quadcopter dynamics in Mujoco, ensuring realistic physics modelling.
- Trained a reinforcement learning policy to ensure stable hovering and precise execution of basic navigation tasks.
- Developed and Integrated failure detection and a PID-based control system for post-failure hover in PX4 stack

Hexapod Robot and Gait Development May 2024 - July 2024

Implemented using unique motion planning method

- Successfully developed a working prototype of the Hexapod robot along with 3 different gait patterns implemented
- Motion planning done by implementing Bezier Curves and Bounding Ellipses to calculate the step of each leg.

VLSI Circuit Design Optimization October 2024

Digital Hardware and System Design Course Assignment

- Worked on optimizing VLSI circuit design for efficient gate layout, reducing wire length, and minimizing delay
- Created an algorithm to place rectangular logic gates compactly, minimizing the bounding box area.
- Developed an algorithm to arrange gates while minimizing the total wire length required to connect them.

AES Decryption on Basys3 FPGA November 2024

Digital Hardware and System Design Course Assignment

- Implemented AES decryption on FPGA board in VHDL language, displaying the output on seven-segment display.
- Developed modules for AES decryption, including Inverse MixColumns, Inverse RowShift, and Inverse Subytes.
- Designed a finite state machine and DRAM controller to manage decryption rounds and operations efficiently.

Manuveral Robotics March 2024

Participating in Hurdle Hovers by Tryst 2024

- Successfully Designed and manufactured a All-Terrain two motored Four-wheel drive Gripper Bot
- Designed a one of a kind Power efficient Drive System along with a Versatile Gripping tool
- Successfully Designed a single PCB -Circuit that operates all systems of the robot

Technical Skills

Programming Languages: Python, MATLAB, C, C++, JavaScript, HTML, CSS, PHP
Frameworks/Libraries: PyTorch, Keras, TensorFlow, OpenCV, Hugging Face, Scikit, Media-Pipe, Mujoco
Tools/Utilities: Git, LaTeX, Autodesk Inventor, SolidWorks

Relevant Coursework

Computer Science and Mathematics: Intro to Computer Science, Calculus, Differential Equations, Discrete Mathematics, Probability and stochastic processes, Data Structures and Algorithms, Digital Logic and System Design, Introduction to Machine Learning*, Introduction to Deep Learning*

Electrical Engineering: Intro to Electrical Engineering, Systems and Signals

Position of Responsibilities

Researcher, *Artificial Intelligence Society, IIT Delhi* August 2024 - May 2025

Executive, *Robotics Club, IIT Delhi* August 2024 - May 2025

Executive, *ACES-ACM (Student Chapter of ACM)* August 2024 - May 2025

Journalist, *Board for Student Publications* June 2024 - May 2025