



Sarthak Raj
Civil Engineering
Indian Institute of Technology Bombay

20D180031
B.Tech.
Gender: Male
DOB: 17-03-2002

Examination	University	Institute	Year	CPI / %
Graduation	IIT Bombay	IIT Bombay	2024	8.31

TECHNICAL SKILLS

Programming:	C, C++, Python, HTML, CSS, Arduino, MATLAB
Environments:	Jupyter Notebook, PyCharm, Visual Studio Code, Arduino
Softwares(Electronics):	Autodesk Eagle (PCB Designing), BQStudios, LTSpice
Softwares(General):	L ^A T _E X, Git, AutoCAD, GNU Octave, MATLAB

RELEVANT LINKS

LinkedIn:	https://www.linkedin.com/in/sarthak-raj/
GitHub:	https://github.com/SarthakRaj1703

MAJOR PROJECTS

Matsya, Autonomous Underwater Vehicle (AUV)

Jan '21 - Present

Prof. Leena Vachhani | RoboNation

- AUV-IITB is a multi-disciplinary, all students team of 55 members working on the **design and development** of an **Autonomous Underwater Vehicle**, Matsya, capable of performing **realistic naval missions**
- Achieved **2nd position** in Video Presentation, **4th position** in Technical Design Report, and **6th position** in website out of **54 International teams** in **RoboSub '21** (online), organised by **RoboNation**

Voyager(Gripper) | Electrical Sub-Division of AUV-IITB

Jun '21 - Present

- Designed a **1 degree of freedom gripper** connected with a **3 degrees of freedom** armature that can each be **autonomously controlled** to grip objects of various dimensions underwater in **naval missions**
- Created a PCB capable of **CAN, USB and RS-485** communication at **10 Mbps** baud rate to control an **H-Bridge Motor Driver** using **PWM Signals** up to a range of **20 kHz** for rotational speed control
- Programming **ATMega328P** using **C/C++** to detect current surges up to **30A** to identify gripping of load

Battery Management System | Electrical Sub-Division of AUV-IITB

Jun '21 - Present

- Designed a **Battery Management System** to measure the **State of Charge (SOC)**, **State of Health (SOH)** and for implementation of **Passive Cell Balancing** and **Dual Battery Redundancy**
- Configured the **BQ76952 Battery Monitoring IC** using **BQStudios** to monitor **4S LiPo Batteries**
- Programmed the **ATMega328P Microcontroller IC** using **C/C++** in the **Arduino** environment
- Established communication between microcontroller and Battery Monitoring IC using **400 kHz I2C**
- Simulated a **Battery Redundancy** circuit on **LTSpice** and observed **10 μ s** switching time.

INDUSTRIAL COLLABORATION

Underwater Remotely Operated Vehicle for Inspection and Surveillance

Jan '21 - Present

Principal Investigator – Prof. Leena Vachhani

Department of Systems and Control Engineering

- Key member** of a team working under Prof. Leena Vachhani to develop a **Class-1 ROV**
- The project is a joint effort by **IIT Bombay and Larsen & Toubro Limited**, under the **IMPRINT II.C Scheme**, a technology development Initiative by MHRD, Government of India
- Currently ready for fabrication; the ROV is aimed to be deployed in Sea waters for scanning and maintenance

SCHOLASTIC ACHIEVEMENTS

- Attained **Department Rank 2** in the **Department of Civil Engineering**, batch of 2024
- Pursuing a minor degree in **Computer Science and Engineering**, IIT Bombay
- Awarded a **Change of Branch to Deptt. of Civil Engineering** (1 out of **1300+** freshmen) (2021)
- Secured **All India Rank 4874** in **Joint Entrance Exam-Advanced** out of **150 thousand** candidates further shortlisted from 1.1 million candidates in **Joint Entrance Exam-Main** (2020)

EXTRACURRICULAR ACTIVITIES

- Participated in **techfests and science exhibitions and competitions** organized regionally (2019)
- Engineered a **Paper Recycling Workstation** for **CBSE Regional Science Exhibition** (2019)
- Participated in the **Rural Immersion Programme** and lived in rural areas to **understand** problems faced by rural India including **sanitation, women empowerment and small-scale industries** (2018)
- Worked for **Le Benevolat** and organized events to **revive the Khadi Industry** of the country (2016-17)