Parth Patil
Electrical Engineering
Indian Institute of Technology, Bombay

170070011
B.Tech.
Gender: Male
DOB: 18-10-1998

Examination	University	Institute	Year	CPI / %
Graduation	IIT Bombay	IIT Bombay	2021	7.51
Intermediate	Maharashtra State Board	Pace Junior science college	2016	85.38%
Matriculation	Maharashtra State Board	J.V.M's New English School Kalwa	2014	92.40%

- Pursuing Honours in Electrical Engineering.

KEY PROJECTS AND PROFESSIONAL EXPERIENCE

RESEARCH INTERN | *SAMSUNG RESEARCH INSTITUTE BANGALORE (SRIB)* [MAY'20-JULY'20]

- Worked with the **IoT RnD** team at SRIB, which works on next-generation **IoT devices**.
- Analyzed the working of **Samsung SmartThings Hub** along-with protocols like Zigbee, Z-Wave, BLE.
- Aided in migration of Cloud based Device Heath monitoring to the Local Hub based monitoring system
- Implemented the **Device state machine models** for the Local Device Watch using C, RUST and groovy .

GOOGLE SUMMER OF CODE | *DJANGO SOFTWARE FOUNDATION (DSF)* [MAY'19-AUG'19]

- Amongst the **only 2** students shortlisted by Django Software Foundation, out of **16.8%** accepted students.
- Enhanced **FormSet** and similar classes, through Improving the inheritance by introducing checks for child classes using **metaprogramming** in Python, thus increasing the productivity and ease of use.
- Prevented **Injection attacks** and creation of new entries in the **database**, by introducing an 'edit only' mode in ModelFormSet, thus strengthening the **security** of the process of amending the Model data.
- Proved theoretically that validating forms with swapped primary keys would be **inefficient** and takes **$O(n^2)$**.

AUV (AUTONOMOUS UNDERWATER VEHICLE) | *PROF. LEENA VACHHANI, PROF. HEMENDRA ARYA* [SEP'17-PRESENT]

- Designed and developed Autonomous Underwater Vehicle named MATSYA, with an overall budget of **5 million INR** capable of localizing itself, performing **realistic naval missions** using visuals form two cameras, intelligent planner, acoustics, depth sensor, underwater communication (UWC), thrusters, and pneumatics.
- Currently working as **Team Advisor** by overseeing the planning and management in all **4 levels** of the team.
- **Winner** at SAVe Competition 2016 & **Joint Winner** in 2018 hosted by the National Institute of Ocean Technology, Chennai. The **only team** in the history of the competition to complete all tasks in the race.
- **Semi-finalist**, among 54 teams, in **RoboSub 2019**, organized by AUVSI & US Office of Naval Research.

Software Subdivision Lead [JULY'19-JUNE'20]

- **Represented IIT Bombay** at International AUVSI Robosub, San Diego, in 2019.
- Assisted in the implementation of automatic dynamic parameter validation and internal logging module.
- Designed **Minimal Mission planner,** which requires **80% fewer parameters** than the existing planner.

Software Engineer [SEP'17-JUNE'19]

- Developed a **web-based Interface** using Django & ROS, that enables non-Linux users to control the vehicle.
- Developed **ML-Tool** capable of marking bounding boxes on objects in a video, using Graphical User Interface, that stores it in custom format, which could be directly used as an **input for a YOLO V2** neural network.
- Implemented a **sensor-fusion** algorithm using an **Extended Kalman Filter** technique for position estimation.
- Reverse Engineered National Instrument's **NI-DAQ** driver to work in ubuntu using a **replay attack** method.

UNDERWATER REMOTELY OPERATED VEHICLE (ROV) | *LARSEN & TOUBRO DEFENCE* | *PROF. LEENA VACHHANI* [JULY'19-PRESENT]

- Designing an **ROV** deployable in seawater for **scanning ship** hulls & for **surveillance** in port/ocean conditions.
- Joint effort by IIT Bombay and **Larsen & Toubro Pvt. Ltd**. under the IMPRINT II.C initiative of **MHRD**.
- Designing an **industrial interface to control** the vehicle and to view the output of different camera feeds.

INTERN | *ACADPAL* | *DESAI SETHI CENTRE FOR ENTREPRENEURSHIP* [DEC'18-JAN'19]

- Designed database for an **E-learning platform** named Acadpal, aiming to improve online teaching quality.
- Deployed an **API server** from scratch using Django REST API and implemented **token-based authentication**.

OTHER PROJECTS

AUGMENTED REALITY GLASSES | *INSTITUTE TECHNICAL SUMMER PROJECT* [APR'18-JULY'18]

- Developed a **heads-up display** (similar to google glass) in a team of four, enabled with **face recognition**.
- Convinced 'Vufine' **to fund the project** by providing with their state-of-the-art wearable display.
- Used a **Raspberry-pi** to run our software stack and a web-server for remote access into the glasses.
- Integrated database, face recognition, and display layers using **inter-process communication (IPC)**.

GRADIENT CLASS ACTIVATION MAP (GRAD-CAM) | *PROF. BIPLAB BANERJEE* | *COURSE PROJECT* [JAN'19-APR'19]

- Implemented Grad-CAM on the **UC Merced** dataset to visualize the parts in the image that caused the activations in a particular targeted class, for the image having multiple objects of different classes.
- Designed and trained **dense layer for a VGG16** model pre-trained on the ImageNet dataset.

UNIVERSAL STYLE TRANSFER | *PROF. BIPLAB BANERJEE* | *COURSE PROJECT* [AUG'19-NOV'19]

- Reviewed and Implemented **NIPS'17 paper** titled "Universal Style Transfer via Feature Transforms".
- Generalized the model for unseen styles **without losing any visual quality** as compared to neutral style transfer by introducing feature transformations in the image reconstruction layer.

6-STAGE RISC BASED MICROPROCESSOR | *PROF. VIRENDRA SINGH* | *COURSE PROJECT* [AUG'19-NOV'19]

- Designed a **6-stage pipelined** data path equipped with **Hazard mitigation** and **Data forwarding** in VHDL.
- It could perform **14 instructions**, with a 16-bit **RISC architecture**, comprising of custom ALU & Memory.

SCHOLASTIC ACHIEVEMENTS

- Secured of **98.85** percentile in JEE Advanced 2017 & Amongst Top **1.3%** student in JEE Mains 2017.
- Recipient of scholarship in **Maharashtra Talent Search Examination,** securing a district **Rank 1,** in 2011.
- Awarded "**Thane Vishesh Gaurav**" for exceptional performance in the SSC board exam by Govt. of India.
- Awarded State government scholarship for High school students, by securing **100 percentile** rank.

SOFTWARE AND SKILLS

Languages	C++, Python, Java, Bash, C, Groovy, Rust, Ruby, Assembly, VHDL
Web Development	HTML, CSS, JavaScript, TypeScript, Jinja, Django, Django-Socket, REST API, Angular, Node.js, React.js, Jekyll, Flask
Frameworks	ROS, Pygames, OpenCV, D-Lib, Numpy, Tkinter, TensorFlow, PyTorch, Pandas, Flutter
Software	Android Studio, Git, Quartus, NgSpice, AutoCAD (2D), SolidWorks
Electrical	Arduino, Raspberry Pi, Tinker-Board, AVR, NodeMCU, Crypton FPGA

POSITION OF RESPONSIBILITY

MANAGER | *DEVELOPER'S COMMUNITY (DEVCOM)* [APR'19-APR'20]

- Assisted in **founding** 'DevCom', which aims to unify all the technical projects inside Institute-level teams.
- Spearheaded and trained a team of sophomores & freshmen students who oversee the development of **InstiApp**, an Android app of the institute which has more than **10,000 downloads** on the Play Store.

DEPARTMENT ACADEMIC MENTOR | *DAMP, EE IITB* [JULY'20-PRESENT]

- Part of a 35-member team selected from 90+ applicants based on a stringent interview and peer reviews.
- Mentoring **six sophomores** from the Electrical Engineering Department on a one-to-one basis on various aspects of their life, including their **academic** and **extra-curricular** pursuits in the institute.

Extra-Curricular Activities

- Completed one year in **NSO (National Sports Organization) in Swimming, 2017-18**.
- Won a **consolation** prize for two years in National Abacus Competition.
- Instructed **Technical Summer School (TSS)** for **Web Development** hosted by the academic council.
- Mentored juniors in various high-reach events like **XLR8, Line-follower, Maze-solver, ITSP**.
- Convenor for **Electronic and Robotics Club (ERC)** and **Web and Coding Club (WnCC)** in 2018-19.

Scholastic achievements and extracurricular activities are not verified by the Placement Cell