Parth Patil
Electrical Engineering
Indian Institute of Technology Bombay

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UG Fourth Year
Male
DOB: 18-Oct-1998

Examination	University	Institute	Year	CPI/%
Graduation	IIT Bombay	IIT Bombay	2017	7.51
Intermediate/+2	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

KEY PROJECTS AND PROFESSIONAL EXPERIENCE

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

- Amongst the **only 2** students shortlisted by the Django Software Foundation in 2019.
- Enhanced FormSet and similar classes increasing the productivity and ease of use.
- Improved the inheritance by introducing checks for child classes using **metaprogramming** in Python.
- 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 **database**.
- Proved theoretically that validating forms with swapped primary keys would be **inefficient** and takes **$O(n^2)$**.

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

- Worked with the IoT RnD team at SRIB, which works on next-generation **EDGE devices**.
- Studied the working of **Samsung SmartThings Hub**, along-with protocols like Zigbee, Z-Wave.
- Aided in migration of a cloud-based Device Monitoring module to a **local hub-based monitoring** system using Rust, C, and groovy which will **save millions of dollars** in cloud computing costs.
- Implemented handling of different initial states in the 'add_device' function in the Local Device Watch module for the devices to be added to the monitoring list.

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

- Designed & developed Autonomous Underwater Vehicle named MATSYA with an overall budget of **5 million INR** capable of localizing itself, performing realistic naval missions using visuals, acoustics, depth sensor, underwater communication (UWC), thrusters & pneumatics.
- Currently working as **Team Advisor** by overseeing the planning and management in all 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 competition to complete all tasks.
- **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, internal logging module.
- Designed **Minimal Mission planner** which requires **80% fewer parameters** than the existing one.

Software Engineer: [SEP'17-JUNE'19]

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

UNDERWATER REMOTELY OPERATED VEHICLE (ROV) FOR INSPECTION & SURVEILLANCE [JULY'19-PRESENT]

LARSEN & TOUBRO DEFENCE | IMPRINT II.C DST MHRD GUIDE PROF LEENA VACHHANI

- Designing a ROV to be deployed in seawater for scanning and maintenance in a 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.

Other Projects And Internships

Intern | *Acadpal* | *Desai Sethi Centre for Entrepreneurship* [Dec'18-Jan'19]

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

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**.
- Persuaded Vufine **to fund the project** by providing with their state-of-the-art heads up 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.**

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 where the image may have multiple objects.
- Designed and trained **dense layer for a VGG16** model pre-trained on the ImageNet dataset.

Universal Style Transfer | *Prof. Biplab Banerjee* | *Course Project* [Jan'19-Apr'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.

Scholastic Achievements

- Secured of **98.85** percentile in JEE Advanced 2017 & Amongst Top **1.3%** student in JEE Mains 2017.
- Recipient of district-level scholarship in **MTSE,** in which secured a district **Rank 1,** in 2011.
- Awarded "**Thane Vishesh Gaurav**" for exceptional performance in 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
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

Manger | *Developers Community (DevCom)* [Apr'19-Apr'20]

- Assisted in **founding** 'DevCom', which aims to unify all the technical projects inside organizational teams.
- Spearheaded and trained a team of 2nd & 1st year students who oversee the development **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**.
- Mentored juniors in various events like **XLR8, Line-follower, Maze-solver, ITSP**.
- Completed an 8-week **Contemporary Dance** camp hosted by Institute Cultural Council.