



**Parth Patil**  
**Electrical Engineering**  
**Indian Institute of Technology Bombay**

**170070011**  
**UG Third Year (B.Tech.)**  
**Male**  
**DOB: 18/10/1998**

Examination	University	Institute	Year	CPI / %
Graduation	IIT Bombay	IIT Bombay	2020	7.42
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

### SCHOLASTIC ACHIEVEMENTS

- Secured of **98.85** percentile in JEE Advanced 2017 among the 1.6 Lakh students.
- Amongst Top **1.3%** student in JEE Mains 2017 from the 13 Lakh which applied
- 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 of Maharashtra State government scholarship for High school students, by securing **100 percentile** rank, on the state level

### PROJECTS UNDERTAKEN

#### GOOGLE SUMMER OF CODE | *DJANGO SOFTWARE FOUNDATION*

[MAY'19-AUG'19]

- Was amongst the only two students short listed by the Django Software Foundation in 2019 and from only 16.8% students whose proposals were accepted
- The project aimed to improve the **FormSet Class** in Django, thus enhancing its functionality & ease of use
- Implemented declarative syntax support for the FormSet class using **metaprogramming** in Python
- Developed an 'edit only' mode for ModelFormSet, which blocked creation of new model entries in the database, thereby enhancing the **security** of the formset.

#### AUV (AUTONOMOUS UNDERWATER VEHICLE) | *SOFTWARE SUBDIVISION*

[SEP'18-PRESENT]

- AUV-IITB is a multi-disciplinary project team aimed at developing an unmanned Underwater vehicle annually with a budget of around 5 million INR capable of operating by itself and performing various tasks
- Represented **IIT Bombay** at **International AUVSI Robosub, San Diego** in **2019**
- Developed a **Web-Based Testing Interface**, which involved integrating Django and ROS in the backend, and HTML, CSS, and JavaScript in the front end
- 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 neural network.
- Implemented a **sensor-fusion** algorithm using **Extended Kalman Filter** technique for POSE estimation
- Joint winners of **NIOT-SAVE** in **2019**, and semi-finalist at **Robosub 2018**

#### AUGMENTED REALITY GLASSES | *INSTITUTE TECHNICAL SUMMER PROJECT*

[APR'18-JULY'18]

- Constructed **heads up display** (similar to google lense), enabled with **face recognition**, remote control, etc
- Used a **Raspberry-pi** that ran face recognition and display programs developed by a team of four, using OpenCV, Dlib, pygames, and Django in python
- Used Django to create a web-interface which can **remotely control** 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]

- GRAD-CAM is a step towards **explainable Machine Learning** over Convolutional Neural Network (CNN)
- Implemented Grad-CAM on **UC Merced** dataset to visualize the parts in the image that caused the activations in a particular class
- Utilized **VGG16** pre-trained model, trained on **Imagenet** dataset to extract features and designed dense layers to generate an output of UC Merced dataset
- Out GRAD-CAM shows features learned by the CNN model for the particular targeted class which may have multiple objects

- Designed a **16-bit microprocessor** in VHDL using Quartus.
- It comprised of 14 Instructions, 8 Registers, RAM, ALU with four functions, signal extenders, etc

- Measured heart rate based on the **PPG** (photoplethysmogram) effect
- Used an Infrared LED, phototransistor pair followed by a bandpass filter and an inverting amplifier to measure heart rate

### PROFESSIONAL EXPERIENCE AND INTERNSHIPS

- Created a Web-app using Django **Rest API** and **Angular** framework
- Managed the backend server and **MySQL** database
- Successfully implemented **token-based authentication**

### SOFTWARE AND SKILLS

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

### POSITIONS OF RESPONSIBILITY

- Managing a team of 2<sup>nd</sup> & 1<sup>st</sup> year students, who oversee the development InstiApp an android app of the Institute which is used by more than 7000+ students
- Design and implement utility software and other small projects in Institute

- Managed different events conducted by the club in the whole year
- Conducted different sessions, and was a key speaker for some events like the "Introduction to ROS", "Ubuntu introduction & Installation", "Arduino Workshop and hackathon"

- System administrator for the website of the Institute Technical Council (ITC), "www.tech-iitb.org"
- Hosted events, competitions, etc. to promote the coding culture in the institute

### KEY COURSES UNDERTAKEN

- **Computer Science:** Machine Learning and Remote Sensing, Computer Programming and Utilization, Number Theory and Cryptography, Computer Graphics\*
- **Electrical:** Signals and Systems, Digital Design, Microprocessor\*, Communication System\*
- **Mathematics:** Data Analysis & Interpretation, Calculus, Linear Algebra, Differential Equations
- **Physics:** Introduction to Quantum Physics, Basics of Electricity & Magnetism

*\* To be completed by November 2019*

### 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**.
- Participated in various competitions like **XLR8**, **RC-Plane**, **Scratch**, **Line-follower**, **Maze-solver**
- Completed an 8-week **Contemporary Dance** camp hosted by Institute Cultural Council.