



Bhuvan Aggarwal
Civil Engineering
Indian Institute of Technology Bombay

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UG Second Year
Male
DOB: 25/09/2001

Examination	University	Institute	Year	CPI / %
Graduation	IIT Bombay	IIT Bombay	2021	8.95
Intermediate/+2	CBSE	Bhavan Vidyalaya, Chandigarh	2019	96.20
Matriculation	CBSE	Bhavan Vidyalaya, Chandigarh	2017	98.00

Pursuing a Minor Degree in the Department of **Computer Science and Engineering**

Scholastic Achievements

- Ranked **Second** out of **120+** students in the Civil Engineering Department ['20]
- Selected to apply for the **OPJEMS** scholarship for being a top performer in the department ['20]
- Achieved **99.5 percentile** in **JEE Main** among 1.5 million aspirants all over India ['19]
- Ranked in the **top 1 %** in **JEE Advanced** amongst more than two hundred thousand candidates ['19]
- Awarded **4 gold medals** in NSO and IMO conducted by SOF India ['14, '12]
- Received **Scholar's Badge** for **6 years** and K.M. Munshi Award in Mathematics for excellence in academics

Technical Projects

SeDriCa, Innovation Cell, IIT Bombay | Senior Perception Engineer [Sept '19 - Present]

Currently one of the 11 finalists among 259 teams in Mahindra RISE Driverless Car Challenge

- Working to develop India's first **Level 5 self driving car**, which is a **fully autonomous car** customized for the Indian road conditions that obeys the Indian traffic rules including the efficiency to safety considerations
- Leading the **Autonomous Parking Subsystem** and working towards parking spot detection using various techniques such as Inverse Perspective Mapping, lane detection using Linknet and YOLO
- Implemented **Kmeans** clustering algorithm and plane fitting algorithm on **3D LIDAR** Point cloud
- Mentored a team of 5 students to build an autonomous maze-solver bot with obstacle avoidance

S.A.S.H.A - Smart Artificial System for Home Automation [Mar '20 - Jul'20]

Institute Technical Summer Project | Institute Technical Council | IIT Bombay

- Developed a **security-enabled, Python-based Chatbot** capable of controlling the electric appliances along with general conversation(using NLP), news report, weather, jokes and much more
- Deployed the bot on **Telegram** for larger user base and also created a **user interactive** website to assist the user with basic commands and facilitate live-tracking along with a home setup generator
- Scaled the bot to add other **energy-saving** features such as **Green House Mode** and **Night Mode**

Autonomous Drone | Flipkart GRiD 2.0 Challenge [July '20 - Present]

Ranked in the Top 3 among the 1000+ participating teams and qualified for the National Round

- Working in a team of 5 students to build an **autonomous drone** satisfying the needs of the competition
- Applied the **Artificial Potential Field** method for real-time path planning of the drone
- Restructured the algorithm to achieve the most **efficient** and **smooth** path and took it a level ahead of the competition to include **obstacle avoidance** and **safety-clearance** in the drone

Mask Detector | Covid Projects | Tinkerers' Laboratory, IIT Bombay [Jun'20 - Jul '20]

- Created a program to **detect** if a person is wearing a mask using **MTCNN** to detect the faces
- Trained a Transfer Learning Model with the base model as **MobileNetV2** for detection of mask

Accident Avoidance System for vehicles [Oct'17 - Feb'18]

- Designed a fully functional accident avoidance system for 4-wheeled vehicles using various sensors such as Fingerprint Scanner, MQ3, RFID, Thermal cameras, Hall Effect sensor and microcontrollers
- Incorporated eye blink rate detection to measure the **Drowsiness** of the driver and also made an attractive **POV Display** using Hall Effect sensor, RGB lighting, ATmega 328p and an exhaust fan
- Presented the project at various competitions and **won** the **CBSE National Science Exhibition** while securing **2nd position** in the **Science, Maths and Environment** exhibition organised by SCERT

Aerial Robotics | Summer Research Project [Apr'20 - Jun'20]

Summer of Science, Maths and Physics Club, IIT Bombay

- Studied the various flight aspects of an Autonomous Drone including Computational Motion Planning, System Design, Controls and Localisation while comparing the algorithms in numerous situations
- Implemented the algorithms in **MATLAB** and studied the effect of parameter-tuning on the results

Plastic Shredder | Sustainable Social Development | NSS, IIT Bombay [Oct'19 - Mar'20]

- Coordinated in a team of 5 students to create a **plastic shredder** to be deployed in the institute
- Ideated on the various specifications of the machine and created a **complete CAD model** of the same

Positions of Responsibility

Convenor | Tinkerers' Laboratory, IIT Bombay [May '20 - Present]

The alumni-funded 'makerspace' for innovators to encourage prototyping and execution

- Working in a team of **7 students** to manage the lab and approve funding for projects, ensuring **optimum utilization** of resources and equipment consisting of an inventory worth **INR 6,000,000**
- Collaborated with the **Director, Global Outreach Programs** at Stanford Byers Center for Biodesign, to organize a long-term **Design Thinking** course and two projects focused on **healthcare technology**
- Executed **30+** projects focused towards **COVID-19** for deployment within the **institute** and **public places**
- Launched Tinkering Bootcamp, a 5-week course in which **100+** students learned about Arduino, IoT, RPi
- Conducted **MATLAB** workshops in collaboration with **MathWorks**, attended by **100+** students

Manager of Virtual Gathering | E-Convocation 2020, IIT Bombay [Jun'20 - Aug'20]

The first-ever Virtual Convocation in India, with 10k+ hits in 6hrs

- Praised by the **Hon'ble Prime Minister** and featured by **30+** media channels including **TOI, CNN**
- Created a **virtual institute** using a third party software to bring the **social aspect** of **convocation**
- Catered to **2500+** **participants** along with **real-time debugging** for the smooth execution of the event
- Directed **120+** **representatives** to create the content and interactions in the virtual platform

Marketing and Infrastructure Coordinator | Techfest, IIT Bombay [May'20 - Present]

Asia's Largest Sci-Tech Festival, with a footfall of 175,000+ across 290+ events

- Assisting the Marketing Heads towards achieving the **fest's budget** through corporate deals.
- Building an extensive database of companies while pitching and negotiating **sponsorship deals**
- Redesigned the marketing and structure of various initiatives and events to fit in the online ecosystem

Industry Experience and Internships

Marketing and Business Development Intern | Network Bulls [May'20 - Jul'20]

- Helped in devising a new **marketing campaign** for the company introducing many innovative and fresh ideas to attract the customers and was an active part of the designing and publicity process
- Managed the **lead generation** and conversion process for the product directly
- Researched on **collaboration** with other brands and successfully forged a **partnership** with **Techfest**
- Formulated the **MoU** for the partnership and was a part of the signing process of the same

Marketing and Design Intern | ChatarPatar [May'20 - Jun'20]

India's first student run production house - journeying towards curating relatable content

- Identified 5+ possible **external associations** and worked for improving the **brand delivery**
- Designed various social media posts and ideated on new and innovative content to attract the viewers

Key Technical Skills

- **Programming languages:** Python, C++, HTML, CSS, Javascript, JQuery, MATLAB, SQL, Bash, PHP
- **Softwares:** Solidworks, AutoCAD, Adobe Photoshop, Premiere Pro, After Effects, Arduino IDE, L^AT_EX, GIT
- **Frameworks:** Django, Bootstrap, Materialize, Tensorflow, PyTorch, Keras, Robot Operating System(ROS)

Relevant Courses

- Python Specialisation - Professor Charles R. Severance, University of Michigan [Grade achieved: 100%]
- Deep Learning Specialisation - Professor Andrew NG, deeplearning.ai [Grade achieved: 100%]
- Introduction to Data Science Specialisation - IBM [Grade achieved: 98.2%]
- Business Foundations Specialisation - Introduction to Marketing, Corporate Finance, Operations Management and Managing Social & Human Capital - University of Pennsylvania [Grade achieved: 99%]
- 4 courses from Entrepreneurship Specialisation - University of Pennsylvania [Grade achieved: 100%]
- HTML, CSS, and Javascript for Web Developers - John Hopkins University [Grade achieved: 100%]

Extra-Curricular Activities

- Received a **Special Mention** for contribution in Sustainable Social Development under NSS, IIT Bombay
- Working on two **startups**, one based on home automation and saving energy and the other for the Prospect 100 X HSI challenge based on wildlife conservation & local community development.
- Created a custom Google Form in **Gscript** to run daily COVID 19 symptomatic check on the students residing in the institute and send alerts to respective authorities immediately
- Designed and fabricated a **Bluetooth** controlled four-wheeled bot with on-board power supply in **XLR8**