



Utsav Desai  
Centre for Machine Intelligence and Data Science  
Indian Institute of Technology Bombay  
[in](#) LinkedIn [G](#)itHub [✉](#) Email

Roll No.: 200100054  
Interdisciplinary Dual Degree  
Gender: Male  
DOB: 24-10-2002

Examination	University	Institute	Year	CPI/%
Graduation*	IIT Bombay	IIT Bombay	2025	8.41

**Auxiliary Degree:** Pursuing a Minor in 'Computer Science and Engineering', IIT Bombay

## SCHOLASTIC ACHIEVEMENTS

- Selected for pursuing IDDDP in Centre for Machine Intelligence and Data Science at IIT Bombay [2023]
- Achieved **99.46** percentile in JEE Mains 2020 examination amongst **1 million +** candidates across the nation [2020]
- Secured **All India Rank 3419** amongst **0.15 million+** candidates in JEE Advanced 2020 examination [2020]
- Obtained a total of **347** marks out of 450 in BITSAT examination conducted by BITS Pilani [2020]
- Secured District **Rank 1** in IAPT examination organized by Physical Research Laboratory(Ahmedabad) [2019]

## PROFESSIONAL EXPERIENCE

### AI and Computer Vision Intern | Michelin

(May '23 - Jul '23)

- Tasked with creating an **autonomous drone** equipped with advanced Computer Vision tools and **voice control** features
- Handling the engineering aspect of ChatGPT's prompt system to ensure smooth conversion of voice commands into actions
- Utilized **Microsoft's AirSim drone simulator** to meticulously **simulate** the 3D environment and project operations
- Successfully **deployed** the project on the DJI Tello drone, allowing **real-time** voice commands and **object localization**
- Integrated the tyre dimensions detection model developed by Michelin in the drone for the data collection purpose
- Presented** the concept of the project and live demo in-person to the **CTO of Michelin, Yves Caseau**

### IAI Project Pipeline Simulation | Godrej Aerospace

(Nov'21 - Dec'21)

- Worked on a simulation software for tube bending on CNC machine for aircraft engines for Israel Aerospace Industries(IAI)
- Identified and Rectified the errors faced in the CNC tube bending simulations on the software provided by SOCO machinery

## POSITIONS OF RESPONSIBILITY

### Vice Lead | Software Subsystem | Team RAKSHAK, IIT Bombay

(June'23 - Preent)

Develop a fleet of robust **Unmanned Aerial Vehicles (UAVs)** to support Search and Rescue Operations in the event of a disaster

- Leading** a team of 10+ students to excel in international competitions, leveraging **cutting-edge** Deep Learning models
- Utilizing Computer Vision models like VGG, YOLO, RCNN, and ResNet for **enhanced** object detection and recognition
- Driving **innovative solutions** and strategies to tackle complex tasks and achieve outstanding results in the competitions
- Collaborating** closely with the Team Lead and Vice Leads to **manage** a team of junior members effectively

### Junior Engineer | Software Subsystem | Team RAKSHAK, IIT Bombay

(May '22 - June'23)

Develop a fleet of robust **Unmanned Aerial Vehicles (UAVs)** to support Search and Rescue Operations in the event of a disaster

- Tasked with developing a Fast RCNN model to recognise alphanumeric, shape and colors from the image captured by drone
- Researched about different approaches and architectures like **YOLO**, **ResNet** for alphanumeric Recognition and Shape Recognition and compared their effectiveness on the basis of computational time required and accuracy of the model

### Marketing Co-ordinator | TechFest, IIT Bombay

(May'21 - Apr'22)

Asia's largest science and technology fest | 5 million+ online reach | 2500+ National Colleges

- Assisted in a social initiative '**NIDAAN**' to spread Breast Cancer awareness and onboarded **10+** NGOs, and **100+** universities
- Articulated an extensive database of **20+** Companies and deliberated with them to increase the overall budget by **100%**

## TECHNICAL STRENGTHS

PROGRAMMING	<ul style="list-style-type: none"><li><b>Languages:</b> Python, C++, Markdown, <math>\LaTeX</math>, SQL, HTML</li><li><b>Data Science:</b> numpy, pandas, sklearn, openCV, scipy, seaborn, tkinter</li><li><b>DL Frameworks:</b> Tensorflow, Keras, Pytorch, Huggingface</li></ul>
INTERESTS	<ul style="list-style-type: none"><li>AI, Computer Vision, Drone Programming</li></ul>

## KEY PROJECTS

---

### Efficient Lane Detection | Computer Vision

(May '23 - Apr '23)

Course Project | Faculty Advisor: Prof. Sharat Chandran, CSE, IIT Bombay

- Incorporated **attention** module within the **LLDNet** architecture, enhancing model's ability to capture intricate lane features
- Employed diverse datasets & applied image augmentation, boosting model's performance by **8%** on low lighting images
- Implemented post-processing techniques, including **morphological** operations, to ensure smooth & coherent lane detection

### Gesture Controlled Drone | Institute Technical Council

(May '22 - July '22)

Institute Technical Summer Project, IIT Bombay

- Designed and trained a **neural network** model for recognizing **ten** hand gestures utilizing **MediaPipe & Tensorflow**
- Mapped controls of **DJI Tello drone** using python code utilizing libraries such as **djitellopy, numpy, pandas, openCV**
- Implemented a **Viola Jones** model & combined with a **PID control** system to direct the drone to track a person's face

### Three Men Morris Game | Decision Analysis and Game Theory

(May '22 - Apr '22)

Course Project | Faculty Advisor: Prof. Urban Larsson, IEOR, IIT Bombay

- Developed an interactive CLI version of a classic game, **Three Men's Morris** using Python, enhancing user engagement
- Incorporated a computer player utilizing the **Minimax** algorithm with **Backtracking**, providing a challenging experience

### Portfolio Optimization | Industrial Engineering and Operations Research

(Feb '22 - Apr '22)

Course Project | Faculty Advisor: Avinash Bhardwaj, Mechanical Engg., IIT Bombay

- Leveraged Python's **Gurobipy** library for **SENSEX** stock portfolio optimization, meticulously investigating varied correlation matrices, including **Distance, Spearman, Kendall, and Pearson**, to discern the optimal correlations among the equities
- Leveraged **Markowitz** optimization model & explored Mixed Integer Nonlinear Programming techniques for stock weight
- Improved weight allocation methods from continuous to integer-based, ensuring realistic portfolio investment decisions

### Facial Expression Recognition with Pytorch

(Dec'22)

Online Project | Coursera

- Implemented an **efficient-net** neural network with an accuracy of **70%** to build a **Facial Expression Recognition** model
- Testing the model on real life dataset and usage of **Image Augmentation** techniques to increase the training dataset

### Image Segmentation with Pytorch

(Dec'22)

Online Project | Coursera

- Created a Image Segmentation model by using the **UNet** model and '**timm-efficientnet-b0**' encoder and imagenet weights
- Utilize **albumentation** library of python for Image Augmentation on the Human Segmentation and Aerial images Dataset

### CFD Modeling of Additive Manufacturing | Manufacturing Processes

(Mar'22)

Course Project | Faculty Advisor: Ramesh Singh, Mechanical Engg., IIT Bombay

- **Spearheaded** a team of **5** to study particle flow in a nozzle used in **Additive Manufacturing** by varying angle of inclination
- Developed an improved model of a partitioned nozzle in **Solidworks** with 18 partitions to maximize the flow symmetry
- Maximised the powder catchment efficiency for a given inclination angle by analysing the particle flow in **Ansys Fluent**

### Deep Face Recognition Model | Computer Vision

(Dec '22 - Jan '23)

Guide: P Balasubramanian | Analytics Club, IITB

- Surveyed literature on state-of-the-art face recognition deep learning models like **Facenet, Deepface** and **Arcface**
- Implemented the FaceNet paper in python and tensorflow using the LFW data containing 5K+ people and 13.4K+ images

## ONLINE COURSES & CERTIFICATIONS

---

### Neural Networks and Deep Learning | Online Course | Coursera

(May'22 - July'22)

- Completed a **4 week** long online course consisting of sessions by industry experts, projects and challenges with real-world data covering the fundamentals of **Deep Learning and Neural Networks**, Digital Image Processing and basics of the CNN
- Trained a convolutional neural network architecture with accuracy of **92%** to recognize alphanumeric digit from drone

### Computer Vision and Image Processing | Online Course | Coursera

(May'22 - June'22)

- Enrolled in a **6 week** long online course on Computer Vision covering various topics including, transformations, histogram and intensity transformations, spatial filtering and classification models including Convolutional Neural Networks

### Python for Data Science and Machine Learning Bootcamp | Online Course | Udemy

(Dec'21 - Jan'22)

- Acquiring knowledge of various libraries like numpy, pandas, matplotlib, SciKit Learn, seaborn, etc. useful in Data Science
- Learned various ML libraries including Linear Regression, Logistic Regression, KNN, Decision trees, Random Forests etc.

## COURSES UNDERTAKEN

---

CS - AI/ML	Computer Networks(M), Introduction to Machine Learning(M), Data Structures and Algorithms(M), Image Processing, Computer Vision, Computer Programming and Utilization, Advanced topics in deep learning for image analysis*, Foundations of Intelligent and Learning Agents*
MATHEMATICS	Linear Algebra, Differential Equations, Introduction to Numerical Analysis, Multi variable and vector calculus, statistical Machine Learning and Data Mining
MECHANICAL	Solid Mechanics, Thermodynamics, Fluid Mechanics, Manufacturing Processes, Engineering Graphics and Drawing, Applied Thermodynamics
OTHERS	Introduction to Electrical and Electronics Circuits, Economics, Philosophy, Quantum Mechanics

*\*to be completed by Nov'23*

## EXTRA CURRICULAR

---

SPORTS	<ul style="list-style-type: none"><li>Secured <b>Rank 1</b> in District Level Skating Tournament and participated in the <b>State Level</b> Tournament for <b>Three</b> consecutive years</li><li>District Champion in Skating for February 2016, October 2016, September 2017</li><li>Member of District team in <b>State Level Rollball Tournament</b> during 2014</li><li>Participated in the <b>State Level</b> Rope Tournament during 2012</li></ul>
SOCIAL	<ul style="list-style-type: none"><li>Took part in 10 days <b>trekking</b> program at Mount Abu organised by <b>YHAI</b> in 2010</li></ul>
MISCELLANEOUS	<ul style="list-style-type: none"><li>Midway prize winner in <b>SARCASM</b> event organized by SARC, IIT Bombay</li></ul>