Anudeep Peela | **170010046**
Aerospace Engineering | **Dual Degree (B.Tech. + M.Tech.)**
Indian Institute of Technology Bombay | **Gender: Male**
Specialization: Aerodynamics | **DOB: 10/6/1999**

Examination	University	Institute	Year	CPI / %
Graduation	IIT Bombay	IIT Bombay	2022	7.71
Intermediate	Andhra Pradesh State Board	Mahathi Junior College	2017	93.80%
Matriculation	Andhra Pradesh State Board	Sri Chaitanya EM School	2015	9.8

RESEARCH EXPERIENCE

ANALYSIS OF AIR TRAFFIC CONTROLLER STRATEGIES [Jan 2020-Apr 2020]

Guide: Prof. Rajkumar Pant, Aerospace Department

- Engineered an **86.38% accuracy** model to predict ATC's expertise; leveraging eye-motion and brainwaves data
- Employed k-means clustering-based imputation for cleaning and utilized heat maps, t-SNE for exploration
- Showcased insights from the project to the **Ex-Director of Airport Authority of India** and **TCS Senior Scientist**
- Shortlisted for publishing technical analysis and results in IITB global alumni newsletter; with reach over **60k+**

AERODYNAMIC SHAPE OPTIMIZATION OF MULTI-LOBED AIRSHIP ENVELOPES [Jun 2021-Present]

Guide: Prof. Rajkumar Pant | Master's Thesis

- Aiming for **20 times computation cost** reduction by building shape optimization pipeline using surrogate model
- Arrived at prediction model with more than 97% accuracy metrics; Improving the model using active learning

PROFESSIONAL EXPERIENCE

TATA STEEL | Supply Chain Analyst [Jun 2021-Jul 2021]

*Optimized **28k+** maintenance spare parts inventory levels by analyzing demand and POs data from the past 5 years*

- Conducted FSN analysis to categorize SKUs located across 10 store locations to ensure **global optimality**
- Proposed 5 strategies resulting in **₹360 million inventory value reduction** from high-value catalog
- Identified tail spend and **projected 9% savings** by recommending new contracts using vendor-spend data
- Suggested **10+ Essential KPIs** to monitor trends and policy alignment by conducting secondary research

DELOITTE| Data Scientist [Jul 2020-Aug 2020]

Collaborated in a team of 2 to build a cognitive enterprise search application enhanced by semantic similarity

- Boosted extract pipeline using Tesseract-OCR and TensorFlow USE to recommend images from text
- Achieved **search time within 3 milliseconds** and scalability through Elasticsearch framework and API

TECHNICAL PROJECTS

INNOVATION CELL [Jul 2019-Jan 2020]

*Team of 20 working on the development of **Autonomous Unmanned Surveillance Drone** for completing in competitions like International Aerial Robotic Challenge (longest-running aerial robotics competition in the world) and Barcelona Smart Drone challenge*

Small Character Detection

- Devised a novel method to detect character from the drone at 50m resulting in **65% less computational resource**
- Incorporated Encoder-Decoder image deblur model to stabilize the image shots captured from the moving drone
- Obtained **accuracy of 94% in character recognition** by training on 2 GB of ground markers shots from DJI Mavic

Reinforcement Learning

- Developed a model to **control UAV in noisy environment** closing the gap between simulation and reality
- Trained the model in MuJoCo considering noisy sensors, aerodynamic forces, and constrained motors
- Adopted **integral term** to remove constant drifts; achieved desired control using proximal policy optimization

Enemy Drone Detection

- Implemented agile quadrotor detection deep learning models using tools like Pytorch, YOLO, RetinaNet

DISASTER RESPONSE WEB APP [Jun 2021-Jul 2021]

Course: Udacity Data Science Nano Degree | Course Project

- Built a web app to assist emergency worker in **filtering help messages** and send it across relevant departments
- Created **Extract-Transform-Load Pipeline (ETL)** to merge datasets, clean and store in SQLite Database
- Performed text pre-processing and trained a Machine learning model using decision tree multi-output classification
- Deployed as **interactive flask web app** using HTML, CSS, JavaScript and Python; ensuring ease of usage

VISUAL QUESTION ANSWERING [Oct 2019-Nov 2019]

Guide: Prof. Biplab Banerjee, CSRE Department | Course Project

- Developed a model to answer a question posed based on the image in a one-word setting
- Utilized **ResNet-152** pretrained model to extract a high-level representation of an image for encoding
- Embedded the text data through word2vec along with **LSTM** with image encoding based on the question

PARALLELIZATION OF TRAVELLING SALESMAN PROBLEM SOLVER [Mar 2021-Apr 2021]

Guide: Prof. S. Gopalakrishnan, Mechanical Department |Course Project

- Parallelized ant colony algorithm to solve NP-Hard travelling salesman problem in optimal time using CUDA
- Achieved **19x speed up** at n as 318 cities; enforcing close convergence rate between series and parallel code

SPACECRAFT TRAJECTORY PLANNING [Oct 2019-Nov 2019]

Guide: Prof. Ashok Joshi, Aerospace Department | Course Project

- Recreated INTELSAT 10-02, Proton-M space mission; reviewed literature to obtain objectives and orbital parameters
- Arrived at burn profile and velocities for the 3 stages based on **10+** calculations simulated using **MATLAB**

CHAIN REACTION SOLVER

Guide: Prof. Krishna S, CSE Department | Course Project [Mar 2018-Apr 2018]

- Programmed a C++ code-based simulation of the 2-player version of the popular Android Game in a team of 3
- Utilized recursion algorithm with 2-dimensional arrays and conditional loops for quick matrix computations

POSITIONS OF RESPONSIBILITY

Placement Manager | Institute Placement Team [Mar 2020-Apr 2021]

*Led a **3-tier** team of **250+** students; entrusted with placements and internships of **3600+** students*

- Revamped entire placement portal to **save 900+ working hours**; focusing on first-ever online placements
- Achieved **75%+ YoY increase** in participation by pioneering sector-specific mock assessments for preparation
- Saved **250+** working hours by developing resume verification platform along with Technical Council
- Increased contacting process efficiency by **80%** using scoreboards**,** thereby **11%** growth in company participation
- Introduced Interview Scheduler & Tracking System ensuring virtual recruitment compatibility in **COVID-19**

Manager| Innovation Cell [Jul 2019-Jan 2020]

*Spearheaded a team of 20; working on the development of **Autonomous Unmanned Surveillance Drone***

- Raised ₹**0.8 million** by directing the pitch of budget proposal to the technical committee of IIT Bombay
- Facilitated recruitment and standardized of interviews for **250+** applicants leading to selection of 14 students
- Trained **8 freshmen** on Machine Learning basics by building in-house material; ensuring transfer of knowledge

SKILL SET

- **PROGRAMMING**: C, C++, Python, SQL, HTML, MATLAB
- **SOFTWARES/FRAMEWORKS**: Pytorch, TensorFlow, Git, Robotic Operating System, ANSYS Fluent, Solid works
- **INTERESTS**: Machine Learning, Deep Learning, Computer Vision, Reinforcement Learning

KEY COURSES UNDERTAKEN

- **MACHINE LEARNING:** Machine Learning for Remote Sensing – II, Machine Learning by Andrew Ng
- **MATHS & STATISTICS:** Calculus, Linear Algebra, Differential Equations I and II, Numerical Analysis
- **COMPUTATIONAL:** High Performance Scientific Computing, Computational Heat Transfer and Fluid Flow
- **AEROSPACE:** Incompressible Fluid Mechanics, Thermodynamics and Propulsion, Solid Mechanics, Control Theory

EXTRA-CURRICULAR ACTIVITIES

- Completed **80 hrs** of community service under NSS IIT Bombay; contributed to initial Vikas group [2017]
- Volunteered in Abhyuday Powai lake Clean-up Campaign leading to 1.5 tonnes plastics clearance [2019]
- Lectured 2 sessions on saving resources and incorporating sustainable practices for **100+** students [2018]
- Guided **150+** students on placement preparation, policy and process in placement orientation [2020]
- Attended Young Leaders Workshop by Centre for civil society on public policy and implementation [2020]
- Engaged as Student delegate in Harvard-US India Initiative 2021 to tackle India's pressing challenges [2021]
- Secured **4th** Position in Pole Vault Event in the Inter Hostel Athletics General Championship [2018]
- Visited Hindustan aeronautics limited manufacturing plant in Nasik as a part of industrial trip [2019]