AREAS OF INTEREST

• Smart Machines • Industry 4.0 • Data Analytics • Deep Learning

SCHOLASTIC ACHIEVEMENTS

- Received **Overall Outstanding Student** award by Department of Mechanical Engineering, IIT Bombay *[March'21]*
- Awarded **AA Grade** in **6 courses** including Manufacturing Automation and Collaborative Engineering*[May'20]*
- Ranked in **top 10** and **First** amongst the Research Assistants in a class of 70+ students in M.Tech *[May'20]*
- Secured **99.21** percentile in Graduate Aptitude Test in Engineering (GATE) among **1.9 lakh** candidates *['18]*
- Secured **99** percentile in JEE-Mains among **1.2 million** candidates with state rank of **191** in Maharashtra *['14]*

M.TECH PROJECT & SEMINAR

- **Smart Press Algorithm for Sheet Metal Forming (SMF):** *M.Tech Project* *[Jun'20-Present]*
  Guide: *Prof. Prashant P. Date*
  o Classifed the SMF parts as defective/non-defective using **ANN model** trained on the simulation data
  o Developed a **Reinforcement Learning** algorithm using SARSA agent to search the optimal process parameters
  o Used Tile Coding for feature vector and experimented to tradeoff between generalisation and descrimination
  o Agent is trained to reach the optimal parameter in less than 150 steps in an environment which is 98% accurate
- **Application of Machine Learning and IoT in Metal Forming:** *M.Tech Seminar* *[Jan'20-Apr'20]*
  Guide: *Prof. Prashant P. Date*
  o Studied and presented various **State of the Art** research papers in Metal Forming and **Machine Learning**
  o Proposed a **novel approach** of using simulation data to minimize the experimentation cost in Deep Drawing
  o Investigated pre-production, production and post-production areas where **quality** can be enhanced
  o Demonstrated the collection and visualization of sensor data onto a **cloud** dashboard, a building block for **IoT**

INTERNSHIP & TRAINING

- **Codespeedy Technologies Pvt. Ltd.** *[May'20-June'20]*
  o Worked on **Python codes** in the field of **Machine learning** including Lasso, Ridge and Elastic Net Regular ization, Data Analysis of multidimensional data, Understanding the Bias-Variance Trade-off in Machine Learning
  o Submitted articles on programs involving **Data Structures** like Arrays, Strings, Linked List, Binary Trees, etc
- **Internet of Things and Machine Learning Training**, by Bolt IoT *[Jan'20-Feb'20]*
  o Implemented **real-time sensor data** collection over cloud and **ML-based decision making** for actuation
  o Used virtual **Linux server** to send the **trigger** to Twilio and Botfather when sensor data was abnormal
  o Developed an interactive interface to control the actuators over mobile app using **javascript** and **HTML**

KEY PROJECTS

- **Classification of Population Based on Income** *Prof Vinay Kulkarni, Course Project* *[Oct'19-Nov'19]*
  o Implemented preprocessing techniques like **feature engineering** & **data visualization** using Sklearn & Pandas
  o Achieved best performance by Decision Trees with an **accuracy of 84%**, experimented with various algorithms like Logistic Regression, LDA(Linear Discriminant Analysis), QDA, Decision Trees, Support Vector Machines
- **Classification of Bee Species using Deep Learning** *Prof P.P. Date, Summer Project* *[Mar'20]*
  o Built a model to detect Honey and Bubble bee from images using 4 layered **CNN** using **Keras**
  o Cropped, transformed and explored various colour channels using PIL module to achieve an **accuracy of 72%**
  o Flattened Images were fed to Support Vector Machines and **accuracy of 64%** was achieved
- **Smart Hand Sanitizing system** *Self Project* *[June'20]*
  o Developed an **automated** hand sanitising system which dispenses the sanitizer using IR signal
  o **Bolt WiFi** module was used to send the data to **Bolt cloud** which is connected to Twilio through **API**
  o **SMS alerts** were triggered if the number of people entering the house are more than people using the sanitizer

- **Real Time Tumour Margin Detection System** *Prof. B. Ravi, Course Project* *[Jan'20-Feb'20]*
  - o Designed a **Hand-held** portable probe to identify **tumour margin** in real time
  - o Studied present products which are traditional rule-based approach and reported their shortcomings
  - o **Manufactured** replica of Cancerous tissue and normal tissue, took images when excited with **670 nm laser**
- **Detection of Car using Deep Learning** *Self Project* *[July'20]*
  - o Using pre-trained **Keras YOLO model** detected and localized each instance of cars
  - o Developed **score thresholding** & **non-max-suppression** from scratch to select right bounding & anchor box
- **Inhaler testing machine** *(Cipla Pharmaceuticals)Prof. K.P. Karunakaran, Course Project* *[Jan'19-Apr'19]*
  - o **Designed** a machine to **reduce** human intervention in the testing of inhalers by up to **50%**
  - o Worked along with a team of scientists at **CIPLA Indore** to increase the reliability of the testing procedure
- **Design of Compact Heavy Duty Torque Multiplier** *B. Tech Project* *[Jan'18-Apr'18]*
  - o Designed and manufactured a lightweight prototype of a lug nut fastener using three-stage planetary gear box
  - o Successfully reached the required criteria of **5000N-m** of torque with a factor safety of more than **1.2**
- **Design Optimization Kappa 3D Printer***Prof. K.P. Karunakaran, Course Project* *[Oct'18-Nov'18]*
  - o Structural design of a standard Kappa 3D Printer was optimized using static analysis in **ANSYS**
  - o Resulting stresses were in limit of **FOS 1.2** for the Aluminium 6061 material and VonMises failure criteria
- **Casting Simulation of Motor Casing** *Prof. B. Ravi, Course Project* *[Oct'18-Nov'18]*
  - o CAD model of Motor casing was developed; gating system, casting yield and solidification time was optimized
  - o Simulated the model using AUTOCAST to analyze hotspots, minimize defects, obtained **61% casting yield**

CERTIFICATIONS

- Neural Networks and Deep Learning, Coursera
- Deep Learning with Python and PyTorch, Edx
- Improving Deep Neural Networks
- Introduction to SQL, Datacamp

POSITIONS OF RESPONSIBILITY

- **Company Coordinator**, Placement Cell, IIT Bombay *[Apr'19-May'20]*
  - o Awarded **Certificate of Excellence** in appreciation for my commitment, work ethics and dedication
  - o Coordinated on-campus assessments, career fair, PPT/tests and others placement activities of **1600+ students**
  - o Managed the recruitment process of **50+ companies** of various sectors as their sole point of contact
- **Research Assistant**, Metal forming Lab, IIT Bombay *[Jul'18-Present]*
  - o Responsible for functioning of the **lab equipment** like UTM machine, MIM machine, Hydraulic press
  - o Managing the purchase requisites, **purchase orders**, **tender approval** as per IITB guideline alongside MMD
- **Teaching Assistant**, IIT Bombay *[Jul'19-Dec'19]*
  - o Responsible for scheduling labs for **150+ B.Tech** and **30+ M.Tech** students in coordination with instructors
  - o Conducted experiments on UTM, MIM machines, taught theory and evaluated the assignments of the students
- **Event Head**, Amazing Race, Mindspark, COEP *[Jul'16-Jun'17]*
  - o **Headed** a team of 5 coordinators and 8 volunteers to manage an event of **1000+ participants**
  - o Responsible for **scheduling**, preparing puzzles, managing logistics and tackling queries from the participants
- **Infrastructure Coordinator**, Mindspark, COEP *[Jul'15-Jun'16]*
  - o Worked in a team of 5 coordinators,**50+ volunteers** to supply logistics to **100+ events** over a span of 3 days
  - o Responsible for **building infrastructure** for events like Robo War, RC Racing and arranging stalls for sponsors

KEY COURSES

- Foundations of Machine Learning
- Foundations of Intelligent and Learning Agents
- Engineering Data Mining and Applications
- Introduction to Robotics

EXTRA-CURRICULAR ACTIVITIES

Sports	• Secured **Gold Medal** in Canoe Racing and **Silver Medal** in Punt Races in Regatta, CoEP • **Captain** of winning school football team at divisional level, represented at the district level • Secured **1st position** (Winner) in group dance competition, PGcult, IIT Bombay
Technical	• Successfully completed one month **IoT Bootcamp** by **CDAC Hyderabad** • Developed a youtube channel for reliable flow of information from senior batches, IIT Bombay • **Represented** Mechanical Department, IIT Bombay at **IMTEX** 2019 and 2020
Organisational	• **Volunteered** the GIAN program under **QIP** organised by IIT Bombay • Trained 50+ students at Solar Student Ambassador Program to assemble solar lamps, contributed in setting a Guinness **World Record** by illuminating **5700 solar lamps** simultaneously

Technical Skills

- Programming: Python, MATLAB, C++
- Modelling: SolidWorks, AutoCAD
- Libraries: Pytorch, SKlearn, Pandas, Keras
- Simulation: ABAQUS, PAM-STAMP