# Curriculum Vitae - **Pruthak Joshi**

## CONTACT INFORMATION

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## EDUCATION

Indian Institute of Technology Bombay *July 2017-Present*
Dual Degree (B.Tech + M.Tech) in Mechanical Engineering
Specialization in Computer Aided Design and Automation
Minor in Industrial Engineering and Operations Research
CPI: 8.92/10

## SCHOLASTIC ACHIEVEMENTS

- Secured an **All India Rank** of **425** among **0.17 million** candidates in **JEE Advanced** *2017*
- Attained an **All India Rank** of **191** among **1.2 million** candidates in **JEE Main** *2017*

## WORK EXPERIENCE

### Lear Corporation, Center of Excellence - Plastics | Intern *April'20-June'20*

- Delivered a design guideline by benchmarking 10+ side valance designs currently in practice using a2mac1
- Analyzed the properties of 15+ plastic materials used in the automotive industry and suggested a material most suitable for side valance manufacturing based on various parameters
- Carried out calculations for comparing the strain generated under impact load in ribbing patterns of the automotive side valance to arrive at a structure with optimal shape and dimensions
- Studied the different impact tests performed on vehicles to visualize the failure of the side valance
- Designed an Excel based calculator for calculating deformation in the ribs based on input design variables

## KEY PROJECTS

### IITB Mars Rover Team *April'18-present*

*Faculty Advisor: Prof. Guruprasad PJ, Dept. of Aerospace Engineering*
*A cross functional team of students which designs and fabricates a semi-autonomous rover for the University Rover Challenge (URC), an international robotics competition conducted by The Mars Society annually at Utah, U.S.A.*

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| Achievements | IRDC 2020 - Bagged **4th** place overall out of **28** International teams |
| | IRC 2019 - Secured **1st** position in Critical Design Review amongst **19** International teams |
| | URC 2019 - Secured **20th** place in System Acceptance Review among **84** International teams |
| | URC 2018 - Secured overall **31st** position amongst **95** participating International teams |

**Team Leader** *April'20 - present*

- Leading a **3-tier** team of **35+** students to design and manufacture a semi-autonomous rover prototype to participate in the annually held University Rover Challenge and the Indian Rover Challenge
- Raising funds and managing resources worth **INR 1.3 Million+** acquired through STP Committee
- Ensuring effective System Integration of the Mechanical, Electrical & Bio-Sciences subsystems

**Subsystem Head: Robotic Arm** *April'19 - March'20*

- Responsible for the **design, analysis, optimization** and **manufacturing** of the robotic arm using simulations on **ANSYS Static Structural** for our upcoming model based on manufacturing constraints
- Designed and analyzed an assembly of **3-link, 6-degree of freedom** carbon fibre based robotic arm and 3-fingered gripper, capable of lifting weights upto **5 kg** and reaching upto a height of **1.2m**
- Revamped the gripper design to **3-fingered** gripper working on **lead screw mechanism**, making it capable of grasping and lifting objects of upto 60mm width
- Conducted summer training sessions for 4 freshmen as a part of team induction program
- Represented the team in **Manufacturing Today Conference and Awards** and other technical expositions

**Junior Design Engineer** *March'18 - March'19*

- Studied about basics of mechanical design and manufacturing processes
- Simulated different components of the robotic arm on Ansys to find areas of improvement
- Performed field testing, prototype making, modification, fabrication and documented manufacturing, installation procedures of the components for the robotic arm subsystem

### Design and Development of Setup for Characterization of Liquid Bridge Separation

*Prof. Prasanna Gandhi, Dept. of Mechanical Engineering* *Summer '19*

- Carried out iterative analysis to firm up dimensions of **parallelogram compliant mechanism** to satisfy given design specifications
- Modeled design iterations in **CAD** software to come up with final design
- Prepared design drawings with **manufacturing tolerances** for fabrication

### Pressure Controlled Skateboard | Institute Technical Summer Project *Summer '18*

*Electronics And Robotics Club, IIT Bombay*

- Ideated, designed and built an electric skateboard, in a team of 4, controlled by the **pressure difference generated due to the body weight** of the rider, enabling it to function without any remote control
- Used **Force Sensitive Resistors(FSR)** to generate a potential difference and supplied it to **Arduino UNO microcontroller** which in turn gave input to **L298N motor driver** for controlling the skateboard
- Used **18.5V Li-ion battery** to power the circuit and **500 rpm brushed motor** for motion of the board
- The skateboard has capacity to carry weights upto **70 kg** and climb slopes upto **15**°

## POSITIONS OF RESPONSIBILITY

### Mentor | Institute Student Mentor Programme (ISMP) *April'19-Present*

- Selected among 95 mentors based on peer reviews and all round performance
- One of 12 students among the entire third year batch chosen on the basis of performance in interviews
- Mentoring a group of 10 freshmen by assisting them in the initial phase of adjustment and facilitate their smooth transition to the academic and social life at IIT Bombay

### Mentor, Department Academic Mentor Programme (DAMP) *April '19-Present*

- Part of a 32 member team, selected from over 95 applicants, which mentors over 150 students, providing academic guidance and general counsel, selected on the basis of peer reviews
- Mentoring 6 students from the sophomore batch to cope with academic difficulties and otherwise
- Acting as a point of contact, aiding the communication between the Faculty and students

### Teaching Assistant | Engineering Mechanics course

*Course Instructor: Prof. Manish Kumar, Department of Civil Engineering* *Jan'19-May '19*

*Course Instructor: Prof. Alok Goyal, Department of Civil Engineering* *Jan'20-Mar'20*

- Entrusted with responsibility of tutoring over 50 students and assisting the professors in invigilation
- Conducted tutorials, consisting of problem solving and concept discussion sessions

## TECHNICAL SKILLS

- **Programming**: C++, MATLAB, Python
- **Software**: AutoCAD, SolidWorks, Ansys, Fusion 360, Adams, LaTeX, Adobe Photoshop

## RELEVANT COURSES UNDERTAKEN

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| **Departmental** | Design of Mechatronic Systems*, Robotics, Microprocessor and Automatic Controls, Manufacturing Processes II, Strength of Materials, Manufacturing Processes I, Mechanical Measurements |
| **Mathematics and Computer Science** | Introduction to Numerical Analysis, Calculus, Linear Algebra, Differential Equations, Introduction to Computer Programming and Utilization |
| **Inter-departmental** | Intelligent Feedback and Control*, Systems Theory*, Optimisation Models, Operations Analysis, Probabilistic Models, System Modelling and Simulation, Introduction to Electrical and Electronics Circuits |

## EXTRA CURRICULAR ACTIVITIES

- Completed a study of **Probability and Statistics** under Summer of Science program by Maths and Physics Club and drafted a report on the same *May'18-July'18*
- Completed an year long training in Lawn Tennis through **National Sports Organization** *July'17-April'18*
- Won **Scratch Day**, a competition held by **Web and Coding Club, IIT Bombay**, which included building a game on Scratch programming language in a team of 2 *2017*