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: 9.02/10

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.

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

Departmental	Design of Mechatronic Systems, Robotics, Machine Design, Microprocessor and Automatic Controls, Nonlinear Dynamics & Chaos*, Strength of Materials, Manufacturing Processes I+II, Mechanical Measurements
Mathematics and Computer Science	Data Structures & Algorithms*, Calculus, Linear Algebra, Introduction to Numerical Analysis, Differential Equations
Inter-departmental	Control of Nonlinear Dynamical Systems*, Intelligent Feedback and Control, Systems Theory, Finite Element Method, System Modelling and Simulation, Introduction to Electrical and Electronics Circuits, Optimisation Models,

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*

∗ *to be completed by April 2021*