PAWANDEEP DHALL

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EDUCATION

Master of Engineering: Mechanical Engineering, Robotics *(3.93 GPA)* — Aug 2022 – May 23
University of California, Berkeley — CA, USA

Bachelors of Engineering: Mechanical Engineering *(3.84 GPA)* — Aug 2018 - June 22
Savitribai Phule Pune University — MH, India

SOFTWARE AND SKILLS

CAD & Analysis : Solidworks, Fusion 360 & Siemens NX | Ansys, Solidworks simulation & COMSOL – FEA & CFD |
Manufacturing : Injection Molding | Casting | Rapid Prototyping | CNC Tooling | Engineering Drawings | BOM |
Non-Technical : Leadership | Problem solving | Engineering Management | Business Planning | Reporting |

WORK EXPERIENCE

Lead Mechanical Engineer, *Shift Robotics Inc* — July 2023 - Present

- Designed and prototyped 9 product iterations for medical & warehouse uses utilizing various manufacturing methods.
- Led a cross-functional needs analysis with medical research and warehouse teams. Identified critical user needs and translated them into actionable product features, driving a significant $100k/month revenue increase.
- Spearheaded on-site manufacturing collaboration in China for new product design & production. Optimized product design for injection molding of complex plastic parts using FEA, achieving a 28% weight reduction (2.5kg to 1.8kg).
- Engineered DFM analysis for new product, identifying and resolving 13 critical issues that saved $200k. Redesigned the electronics enclosure of the robotics shoes from no protection to IP54 and comply with UL2272 certifications.
- Built intricate rigs replicating walking gait & impacts by 90% – a 7x improvement over previous rigs at the company.

Innovator in Residence, *University of California Berkeley* — Jan 2023 – May 23

- Led cross-functional teams of students and industry experts to develop and launch innovative products from POC to launch and secured funding worth $150k at the university venture competition.
- Conducted market research and user needs analysis to translate customer insights into actionable product features for next-generation devices.Collaborated with external stakeholders (startups & industry experts) to identify emerging trends and technologies, driving the development of advanced user products software and hardware both.

Robotics Engineer Intern, *Tech Services* — Feb 2022 – May 22

- Assisted in the qualification and validation testing of ABB 5400 S4 robots, achieving an 8% improvement in response speed and joint acceleration, directly impacting production efficiency.
- Developed comprehensive protocols, test reports, and traceability matrices for operational and performance testing of ABB 5400 S4 robots. Ensured adherence to quality control standards and facilitated future maintenance.

Mechanical Engineer Intern, VR Coatings Pvt. Ltd — Sep 2021 – Dec 21

- Designed and optimized a novel spray coating nozzle using CFD simulations in ANSYS Fluent. Achieved a 70% efficiency improvement, significantly impacting production processes.
- Spearheaded the design of a groundbreaking multi-functional 3D printer capable of printing with proprietary materials. Provided engineering drawings with GD&T according to ASME Y-14.5 standards for manufacturing.

Founder, *Ekka 3D Printing* — Aug 2019 – Feb 21

- Delivered rapid prototypes within an average lead time of 1 week for over 40 engineering design projects.
- Reduced production costs by an average of 15% through design, analysis, and rapid prototyping for alternative materials and processing methods like injection mold, cast, forge and stamp.
- Involved in R&D of Electric furnace, CNC, Filament extrusion, Injection molding machine and Wire bending machine.

RELEVANT PROJECTS

Next Gen Lunar Rover, UC Berkeley Capstone Project Outerspace Robotics   (Link)

- Developed a CAD model with 36 subassemblies in Solidworks after researching several design trade-offs.
- Optimized rover design for extreme environments. Performed comprehensive Finite Element Analysis s analysis using ANSYS. Analyzed 45 components and performed explicit dynamics simulation under crash conditions.
- Produced high-quality engineering drawings with GD&T according to ASME Y-14.5 standards for manufacturing.
- Reduced the overall weight of the rover by 38% through topology optimization in ANSYS and Solidworks.

Exo-skeleton for people with paraplegia, Berkeley Robotics & Human Engineering Laboratory Robotic Locomotion

- Developed a high-fidelity Simulink model (79% accuracy) of human swimming using a 6-degree-of-freedom simmechanics model. Used for design validation of aquatic robots or exoskeletons.
- Incorporated 6 sensors in self designed plastic, self designed PCBA enclosure.
- Engineered an IP57- rated exoskeleton by selecting and implementing waterproofing techniques and materials.
- Optimized exoskeleton structural integrity by 30% through structural and fatigue analysis. Reduced fatigue points from 24 to 9, enhancing the exoskeleton's durability and safety using ANSYS Finite Element Analysis tools.
- Manufactured a complex exoskeleton utilizing diverse subtractive manufacturing techniques (turning, milling).

Economical multipurpose 6 axis articulated arm, Final Year Undergraduate Project   (Link)

- Modeled CAD of the arm for rapid prototyping in Solidworks based on the DH parameters & torque calculations.
- Developed & analyzed a modular end effector with cutting, spraying, grinding, and drilling functionalities.
- Leveraged fused deposition modeling and stereolithography 3d printing method to manufacture the robot arm.

Multi nozzle diameter extruder for FDM 3D printer, Research and Development of Additive manufacturing

- Created a radical extruder with a changeable nozzle after researching a variety of 3D printers and extruders.
- Increased printing speed by 28%, structural strength by 62%, & surface roughness with the groundbreaking design.
- Contributed to the development of cutting-edge slicing software with 7 features by writing the Gcode.

AWARDS AND PUBLICATIONS

JN TATA Scholar | **Merit Based** scholarship UC Berkeley | **Innovator In Residence** UC Berkeley | **Winner** 4 National competitions | **Runner up International** Dassault systemes | Solidworks **Champion** | Solidworks Certified **Expert** |

- *(4 Patents)* Smart valve system | The Palanca | The Detener | The Velocidad
- *(Academic Publication)* Weight reduction of airfoil using generative design & structural analysis   (Link)
- *(Academic Publication)* Electrical Discharge Machining Process optimization   (Link)
- *(Academic Publication)* Investigating the effect of cryogenic treatment of workpieces on EDM performance   (Link)
- *(Academic Publication)* Prediction of Surface Roughness Using Desirability Concept and SVM   (Link)

HOBBIES

Formula1 | Go Karting | 3D Printing | Designing DIY projects **|** Scaling down & redesigning big machines | Trekking | Cricket | Entrepreneurship | Reading business case studies | Doodling invention journal book | Tech unboxing videos |