Richal Balasaheb Abhang

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Experience

GRASP Sung Lab, University of Pennsylvania *Sep 2022 - Present / Philadelphia, USA*

Research Assistant
- Researching tunable compliance manipulator in design and material selection aspects under soft robotics.
- Performed design optimization for lightweighting, and modularity of the assembly.

Key Focus: CAD (SolidWorks 2022) | Mechatronics | Fabrication | Material Science

Inter-University Center for Astronomy and Astrophysics *Jun 2019 - Jul 2022 / Pune, India*

Research Project Student
- Designed and built Single-stage Suspension Module based on HAM AUX.
- Generated Analytical model in MATLAB for Folded Pendulum low frequency monolithic horizontal Seismometer, developed CAD (SolidWorks 2021) and FEA model (COMSOL), and assembled it with sensors.
- Worked on 2D drawings (drafting), planned the procedure for precision machining, and designed jigs and fixtures.

Key Focus: CAD (SolidWorks 2021) | FEA (COMSOL) | GD&T | MATLAB | Precision Manufacturing

Kick Robotics, LLC. *Oct 2020 - Nov 2021 / Hyattsville, USA*

Remote Mechanical Intern
- Devised mechanisms for robots assigned with different tasks and challenges; performed FEA of the structures.
- Developed CAD models that get 3D-printed and assembled to form the mechanical structure of the robots.

Key Focus: CAD (SolidWorks 2020) | FEA (Ansys) | 3D printing | Mechanical design of Robots

Projects

CNC precision Manufacturing *Jan 2023 - Present / Philadelphia, USA*
- Designed and manufactured a miniature duck using Prototrak Mill and CNC Haas Mini Mill for machining.
- Manufactured Molding tools using the CNC Haas Mini Mill followed by Plastic Injection Molding on Morgan Press.
- Designed and manufactured a Chess set where chess pieces were machined on CNC TL-1 Lathe.

Key Focus: KeyShot (Rendering) | SolidWorks 2022 | MasterCAM

Characterization of Stainless Steel (SS) 316 at Cryogenic temperatures *Sep 2021 - Jul 2022 / Pune, India*
- Performed tests like tensile, impact, XRD, SEM, hardness, and optical metallography to compare different properties of SS 316 at room and cryo temperatures.
- Annealed a few samples at high temperatures and then cryo-treated them to compare properties.

Key Focus: Cryo-testing | Mechanical Testing | Optical Metallography | Material Characterization

CANSAT Competition 2019 and 2020 *Nov 2018 - Feb 2020 / Pune, India*
- Engineered a descent control system using autogyro in 2019; customized design for a better quality of 3D printed parts; performed Finite Element Analysis.
- Headed a team of 15 students.

Key Focus: CAD (SolidWorks 2019) | FEA (SolidWorks 2019) | Rotary Wing Design | 3D printing

Skills

CAD Modeling Software	SolidWorks | Fusion 360 | AutoCAD | CATIA | MasterCAM
Analysis Software	MATLAB | COMSOL | ANSYS | GMAT | WIPL-D | Qblade | GRASS GIS | X'pert
Programming Languages	Python | C++ | C
Frameworks & Libraries	PyTorch | Matplotlib | Numpy | Arduino
Other	GD&T | Machining | Molding | SEM | Mechanical Testing | 2D Drawing | CNC

Education

University of Pennsylvania *Aug 2022 - Present*

MSE in Mechanical Engineering and Applied Mechanics (Concentration: Robotics)
- Courses: Advanced Dynamics, Integrated CAD/CAM/Analysis, Design of Mechatronics Systems, Micro and Nano Electromechanical Systems, Machine Learning.

Savitribai Phule Pune University *Jan 2021 - Jul 2022*

M.Tech in Mechanical and Materials Engineering
- Courses: Advanced Stress Analysis, Theory of Vibration and Noise Control, Nanotechnology, Smart Materials.

MIT College of Engineering, Pune *Jul 2015 - May 2019*

B.E. in Mechanical Engineering
- Courses: Design of Machine Elements, Manufacturing Process, Product Design and Development, Dynamics of Machinery, Mechanical System Design, Finite Element Analysis, Metrology and Quality Control.

Certifications

Certified SolidWorks Professional *Oct 2019*

by Dassault Systems