Shubh Raval

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Technical Skills

Software: Solidworks CSWA, Fusion 360, Solidworks Static FEA & Frequency, Ansys, Smartsheets, Microsoft Projects, Microsoft Visio, LTspice, Patternsmith, Fusion Static FEA, Onshape, ROS2 Humble, Moveit Motion Planning, Abaqus CAE

Languages: Python, C++, XML, URDF, MATLAB, Simulink, Simscape

Engineering: GD&T,DFM, DFA, Design Verification and Validation Testing, Manufacturing Instructions, Template Development, Lean Six Sigma, Standard Work, Systems Engineering, Compliant Mechanisms

Fabrication: FDM, SLS, SLA, 3-Axis Mill, 5 axis CNC, Horizontal & Vertical Bandsaw, Belt Sander, Hand Tools, Soldering

Technical Experience

Kazvu Labs   **June 2024 - Onwards**
Electro-Mechanical Engineer I
- Co-led the mechanical and structural design of a novel 7-DOF cobot for commercial, human-centric environments, optimized for fast, extended-reach, and complex manipulation tasks.
- Led multimodal structural optimization, analyzing 500 robot permutations (~200 GB of data) through Forward Kinematics-based workspace exploration and Jacobian analysis, using Python for data collection, analysis, and visualization.
- Developed a voxel-based workspace validation method, utilizing Inverse Kinematics pose probability heatmaps in Python to assess performance before CAD-based URDF validation.
- Led design and structural FEA analysis of two modular coupling mechanisms in 7075 Aluminum for modular cobot
- Designing lightweight cobot linkages using braided carbon fiber, optimized for bending moment resistance via FEA.
- Managed ROS2 and MoveIt integration for proprietary planning GUI, overseeing development, testing, and deployment.
- Authored and maintain an automated Xacro robot description with tool permutations and package generation, using Python (scripts), XML (macros), and YAML (configurations) to support motion planning GUI development within a CDCI pipeline.
- Contributed to robotic joint design, focusing on rotor optimization, cable management, motor and transmission selection, and C++ hardware interface development for ROS2 Control integration.

Amazon Robotics   **January 2023 – June 2023**
Hardware Engineer Co-Op
- Led the Design Verification process development and testing of package sortation cart with 800,000+ active units in North America and upcoming package sortation cart both interfacing with autonomous robotic systems in Amazon Fulfilment Centers.
- Identified and resolved 5+ non-conformities through comprehensive verification testing
- Authored 2 detailed Design Verification procedures serving as verification deliverables for 60+ specifications
- Performed testing using a variety of measurement devices, coordinated with additional stakeholders to drive robotic and random vibration testing, Designed and Fabricated jigs and sheet metal brackets for load based testing
- Designed Sheetmetal pinch guard for rapid prototyping of ergonomic requirement of pinch guards for design of new carts

Medtronic Neurovascular   **June 2022-August 2022**
Global Operations & Supply Chain Engineering Project Management Intern
- Led the creation of new Lessons Learned template, streamlining of PMO Playbook, consolidation of best practices from prior transfer programs, and update to Phase Gate Review template.

Kairos Power   **January 2022-June 2022**
Mechanical Engineering Co-Op- Test/R&D Engineering
- Designed squealers to be placed in high temperature fluoride salt pump to detect vertical and horizontal deflections less than 1/8in, used FEA to iterate design considering impact loading, created drawings for use in EDM manufacturing using GD&T
- Designed 6-part aluminum mold for abs pellets aiding development of test unit's reactor core to simulate fluid flow
- Developed improved impeller design by creating foils that are individually machined and welded instead of unibody machined, aiming to reduce lead time from 6 months to 4 weeks

Applied Composites   **June 2021-September 2021**
Mechanical Engineering Intern- Continuous Improvement
- Led CI project for SpaceX Falcon 9 thermal protective system manufacturing (TPS) resulting in a 33% increase manufacturing efficiency over 32 parts and about $7000 material cost savings
- Developed Manufacturing Instructions and Training Program using Standard Work and Lean for TPS manufacturing
- Designed 75+ Ultem jigs and 100+ cut kits using Solidworks and Patternsmith to be used in new automated Pyron processing

The Boring Company   **March 2021-May 2021**
Manufacturing Engineering Intern
- Worked as a liaison between engineering, production, and purchasing teams and reported daily production status using ANDON format to senior level management and oversaw efficient production of +25 parts using Smartsheets

Education

Georgia Institute of Technology   **August 2024 - May 2026**
    Master of Science in Mechanical Engineering GPA: 3.5

University of California, Los Angeles (UCLA)   **September 2021 - June 2024**
    Bachelor of Science in Mechanical Engineering GPA: 3.60