Shubh Raval

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Education

Georgia Institute of Technology **August 2024 - May 2026**

Master of Science in Mechanical Engineering GPA: 3.75

University of California, Los Angeles (UCLA) **September 2021 - June 2024**

Bachelor of Science in Mechanical Engineering GPA: 3.60

Technical Skills

Design/Analysis: Solidworks CSWA, Fusion 360, Solidworks Analysis, Ansys, LTspice, Fusion FEA, Onshape, Abaqus CAE

Robotics: ROS2 Humble, Moveit2 Motion Planning, URDF, XML, Kinematic Analysis

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, Systems Engineering, Compliant Mechanisms, Multi-Objective Optimization, Axiomatic Design, Agile

Prototyping: FDM, SLS, SLA, 3-Axis Mill, 5 axis CNC, Horizontal & Vertical Bandsaw, Webb Lathe

Technical Experience

Kazvu Labs **June 2024 - Onwards**

Electro-Mechanical Engineer

- Co-led design, build, and integration of a 1.8 m 7-axis collaborative robotic arm for dexterous, human-centric tasks
- Delivered alpha unit in 13 months at ~50% of UR10e BOM cost with +/- .5mm accuracy and 100% workspace coverage
- Developed Python meta-model (polynomial regression) for multi-objective robotic arm optimization of kinematic structure to guide mechanical design—achieving 4× dexterity vs UR10e validated in MoveIt2 kinematic simulation
- Designed 3 actuator sizes in Fusion 360 using strain-wave generators and 3-phase BLDC motors; smallest unit achieved ~63 Nm torque output at $3,000 BOM cost (pre-DFM)
- Engineered carbon fiber structures bonded to aluminum flanges, achieving ~10% mass reduction and 1.5× stiffness gain vs 6061 aluminum using quasi-isotropic layup schedule
- Owned structural design of bolted joints, 2 modular couplings Marman clamp and threaded hose connector inspired, and FEA verification of couplings and aluminum linkages developed specifically for initial testing
- Fabricated fixturing in SLA, FDM, and 6061 for actuator testing and assembly, hand-eye calibration, carbon fiber bonding
- Contributed to ROS control stack: authored URDF/Xacro robot model (XML), implemented MoveIt2 motion planning in C++, wrote data-analysis scripts (pandas), and served as the hardware–software liaison in a 3-person cross-functional team

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 integrated with autonomous robotic systems in Amazon Fulfillment 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 by using a variety of gauges, coordinating with test engineering for robotic and random vibration testing, designing and fabricating jigs and sheet metal brackets in SolidWorks for load-based testing
- Designed and prototyped sheet metal pinch guards for ergonomic requirement of pinch protection in 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 800 degree F 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 redesigning 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