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Research & Development | Design | Hardware | Test Engineering

Work Experience

Lead Engineer

Marlborough, MA

Catalytic Consulting Inc.

April 2024 - Present

- Optimized Cycle Test Stand performance for EDI ultra-pure water filtration systems, enhancing reliability and reducing operational costs by over \$1 million in under 6 months.
- Revamped documentation workflows, facilitating the creation of customer-centric materials, enhancing operational excellence and engineering productivity, and increasing sales by \$2 million.
- Engineered innovative product designs for clients, reducing production costs, boosting revenue, and expanding market presence.

Test Developer

Westborough, MA

Amazon Fulfilment Technologies and Robotics (Contract)

May 2024 - October 2024

- Led a team of 3 engineers to conduct comprehensive testing for an advanced rigid packaging automation machine costing \$3M in bridging 3 years in time to market for the customer.
- Delivered actionable performance and functional metrics including failure root cause through data analysis to product owners, resulting in a 30% reduction in downtime.
- Captured test results, analyzed data, and provided concise, actionable testing reports that translated engineering findings into clear recommendations for project sponsors and stakeholders.
- Developed rigorous test plans, test procedures, and test cases reducing system fault rates by 20%.
- Conducted Process Failure Mode and Effects Analysis (PFMEA) to proactively identify potential failure modes and optimize the process design and material handling mechanisms based on test findings.
- Created testing checklists and cross-verification matrices to ensure thorough evaluation and data validation.

Test Engineer II

Boston, MA

SparkCharge Inc.

April 2023 - December 2023

- Led the development of a critical core product service tool that helped resolve firmware bugs, ensuring brownfield deployed products remained serviceable maintaining customer relationships.
- Spearheaded end-to-end development of the service tool - writing PRD, designing 3D mCAD in Solidworks, Designing eCAD PCB in Altium, and Performing failure analysis, test, and validation.
- Accomplished unparalleled reliability on the service tool through DFMEA, identifying potential points of failure and implementing corrective actions which drove customer retention up to 80% and product success.
- Designed a proposal for an End-Of-Line Charger Test Fixture for the in-house manufacturing facility in under 3 months enabling quicker go-to-market strategies and accelerating the project timeline by 30%.
- Developed and executed test plans for Firmware releases and new component validation towards requirements, and reduced potential product failures by 10%.
- Write, review, or approve documentation like technical specifications, Engineering reports, test specifications, design reviews, and presentations(EVT, DVT, PVT) supporting new product development.
- Addressed high-priority sev1 and sev2 customer issues for the core product line and provided root-cause & mitigation plans in the form of design or test procedure changes that alleviated customer issues and reduced their occurrence in the field by 15%.
- Run everyday tests in a high-power lab to support R&D design validation prototypes, component validation, EVSE Protocol testing and Analyze data towards applicable ISO, UL, and NEMA Standards.

Development Test Engineer

Chennai, IN

Agnikul Cosmos Launch Vehicle Pvt. Ltd.

January 2019 - August 2019

- Fully realized a semi-cryogenic Test stand from ideation to launch in under 3 months driving system success and generating crucial data that directly contributed to securing a \$3.2 million seed funding round.
- Designed and built 4 test systems to qualify subsystems of a launch vehicle for FAA flight qualification.
- Reduced cost by about 80% by designing electro-mechanical valves in-house.
- Implemented innovative test design methodologies using principles of design of experiments to strategize and execute efficient testing procedures that generate characterization data to help validate designs.
- Performed Trade-offs for components to balance performance, budget, and reliability.
- Performed analytical work to conceptualize and characterize new designs by assisting with arbitrary numbers related to stress, dynamics, and heat transfer.
- Minimized risks by drafting safety checklists and implementing testing and safety compliance.

R&D Intern**Chennai, IN**

Lema Labs Robotics Technologies Pvt. Ltd.

December 2017 - September 2018

- Developed & designed robotic kits from concept and proof of principles to specifications & implementation.
- *Designed parts in Fusion 360 & Creo and performed FEA Analysis using Ansys and Fusion 360.*

Project Intern**Chennai, IN**

RapidFab 3D Engineering Solutions Pvt. Ltd.

January 2018 - April 2018

- Developed a novel SCARA robotic-arm 3D Printer using Fusion 360 and Ansys.

R&D Hardware Intern**Chennai, IN**

Rent&Make Virtual Makerspace

July 2016 - December 2016

- Researched, designed, developed, and optimized open-source prototyping hardware.
- Responsible for managing and deployment of 4 major products to customers.

EDUCATION**University of Florida****Gainesville, FL***Master of Science in Mechanical Engineering**2021 - December 2022*

- Team member - Structures and R&D; Gatorloop - Hyperloop team of UF
- Coursework - Innovation 4 Defense, Engineering Innovation, Divergent Thinking, Engineering Project Management, Fundamentals of Production Engineering, Advanced Manufacturing, Geometry of Robots

Anna University**Chennai, IN***Bachelor of Engineering in Mechanical Engineering**2014 - April 2018*

- Active Participant in Local DIY and Makerspace Communities working with IoT, SBCs, 3D Printing, and AI.
- Coursework - Finite element analysis, Fluid Dynamics, Design of Machine Elements, Dynamics of Machines, Principles of Management

PROJECTS

- **Protection Up High** - Dept. of Defense; US Navy; NIWC Atlantic *August 2022 - December 2022*
Identified innovative radio DF solutions to help pilots of C-130 aircraft identify ground-based threats
- **Health monitoring for people in isolation** - University of Florida *May 2022 - August 2022*
Designed a suite of products for monitoring the physical and mental health of people in Isolation
- **Semi cryogenic liquid prop engine test stand** - Agnikul Cosmos *April 2019 - August 2019*
Designed a thrust test stand to qualify a semi-cryogenic liquid prop engine to FAA regulations
- **SCARA robotic arm 3D Printer** - RapidFab 3D Engineering *December 2017 - May 2018*
Designed a novel approach to a robotic arm-type 3D Printer
- **Experimental Lunar Payload** - Team Algol/Team Indus *August 2016 - December 2016*
Designed a coke can-sized experimental payload to evaluate the presence of life on the lunar surface

TOOLS & SKILLS

CAD Design: AutoDesk; AutoCad, Inventor, Fusion 360 | DS; CATIA, SolidWorks | PTC; Creo

Analysis: Simscale, Ansys | PCBA: Altium

Programming Languages: Python, Embedded C, Matlab

Other skills: GD&T, Machine shop experience, High-Pressure Plumbing, 3D Printing, IoT, Machine Learning

Proficient in Microsoft suite, Google suite, Atlassian Tool Suite (JIRA, Confluence), Linux, and Git

AWARDS & CERTIFICATIONS

- Engineering Innovation Certificate - Engineering Innovation Institute, HWCoe, University of Florida
- Achievement Award scholarship - Herbert Wertheim College of Engineering
- Graduated Air Wing National Cadet Corps ranked Flight cadet in 2017