

# Abishek Arumugam Navukkarasan

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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

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### 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

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- **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

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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

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- 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