

Sajith Velmurugan Subalakshmi

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[LinkedIn](#) | [Sajith_Portfolio](#)

PROFILE

Mechanical and propulsion engineer with an MSc in Robotics and AI. My MSc research derived a closed form analytical model of a structural instability in soft actuators and validated it against finite element analysis, my undergraduate work took a magnetoplasmadynamic thruster from CAD and Ansys CFD through to a fabricated and fired demonstrator. Strengths in SolidWorks and AutoCAD design, Ansys CFD and FEA, and fabrication. Seeking a graduate engineering role in aerospace, propulsion or mechanical design.

EDUCATION

MSc Robotics and Artificial Intelligence

2025 - 2026

Queen Mary University of London, London, UK

Modules: Robotics, Machine Learning, Computer Vision, Autonomous Systems, Artificial Intelligence.

BE Mechatronics Engineering (AI & ML minor)

2022 - 2025

Hindusthan College of Engineering and Technology, India

First Class - CGPA 8.09/10 (UK equivalent, 2:1).

Modules: Control Systems, Robotics, Embedded Systems, Automation, Mechanical Design, Electronics.

Diploma in Mechanical Engineering

2019 - 2022

Lakshmi Ammal Polytechnic College, India

First Class with Distinction - 87%.

Covered: Mechanics, Thermodynamics, Engines, Hybrid Power Generation.

ENGINEERING PROJECTS

Magnetoplasmadynamic (MPD) Thruster - Design, Simulation & Build

- Designed the full thruster assembly, including plasma chamber and nozzle, in CAD and modelled it in Ansys.
- Ran CFD analysis characterising velocity flow, mass flow rate, static temperature, total pressure, turbulent kinetic energy and turbulent viscosity across the flow path.
- Adapted the conventional vacuum operating MPD concept for atmospheric operation using a separate reaction chamber.
- Fabricated and tested a working butane fed demonstrator rig, validating the design against the simulation results.
- Published the design, methodology and performance analysis in the Journal of Propulsion Technology.

Analytical Modelling of Snap Through in a Preloaded Bistable Strip

- Derived a analytical model of a bistable soft actuator strip from Kirchhoff rod theory, establishing a stiffness hierarchy ($B/A \approx 2844$) that confines deformation to bending and twist.
- Solved the preloaded equilibrium by constrained energy minimisation with a torsional boundary layer treated by matched asymptotics.
- Validated against a geometrically nonlinear ANSYS shell model, preloaded tip position predicted to 0.59% with zero fitted parameters.

PLC Operated Compressed Air Engine

- Designed and built a working air compressed engine applying thermodynamic and mechanical first principles.
- Implemented PLC based control of valve actuation and engine timing, integrating pneumatics with automated control.
- Published the design and findings as a second journal paper.

3D Printer - Design and Build

- Built a functional FDM 3D printer from the ground up: frame and motion assembly, electronics, and Arduino-based control.
- Tuned motion, calibration and firmware to achieve reliable, repeatable print quality.

ENGINEERING EXPERIENCE

Fabricator - University Go Kart Team

2022 – 2025

Hindusthan College of Engineering and Technology, India

- Designed and built go karts within a student engineering team across successive build cycles.
- Produced and interpreted engineering drawings, then fabricated and assembled mechanical components to specification.
- Operated hand and power tools to manufacture parts and carried out inspection and quality checks on finished assemblies.
- Worked to fixed competition deadlines through iterative design, build and test cycles.

TECHNICAL SKILLS

Design & Analysis:	SolidWorks, AutoCAD, Ansys, CFD, Mechanical Design, Thermodynamics, Pneumatics
Programming & Simulation:	Python, C, C++, MATLAB & Simulink, Arduino
Control & Automation:	Siemens PLC, Control Systems, Embedded Systems, Autonomous Systems
Robotics & AI:	Robotics, Machine Learning, Computer Vision
Manufacturing:	Fabrication & Assembly, Workshop & Hand Tools, Inspection & Quality Checks