Ashwin M R

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LinkedIn | ORCID: 0000-0001-6214-7129 | Portfolio

Education

University of Illinois at Urbana–Champaign (UIUC) Expected Dec 2025
Master of Engineering in Aerospace Systems Engineering, Grainger College of Engineering
Ongoing study with Prof. Jason Merret on MBSE integration with Generative AI for Aerospace Systems
Activities: Illini Chess Club; Illini Run Club

Technical skills

Simulation Softwares: ANSYS (CFX, Fluent, Transient Structural), OpenFOAM, COMSOL Multiphysics, ABAQUS, Solidworks, Creo Parametric, MeshLab, Matlab;
Programming Languages: C++, Python, HTML, CSS, Javascript;
OS: Windows, Fedora, Arch, Ubuntu;
CFD: AMR, Multiphase Flow, Turbulence Modeling, Discretization Methods, Post-processing, CHT;
Experimental Skills: TPS Characterization, Sensor Calibration and Heat Flux Mapping, IR Thermography, Radiative Property Testing, Heat Flux Gauges and Thermocouples;

Experience

Indian Space Research Organization (ISRO), Thermal Simulation Lab — Trivandrum, India Jan 2024 – Jul 2024
Graduate Apprentice

- Developed MATLAB code to convert 3D ray-tracing coordinates into ANSYS CFX input format.
- Performed design and ray-tracing analysis on a 500 mm filament IR lamp mounted on a High-Performance Radiant Heater (HPRH); simulation targeted uniform heat flux of 130 W/cm^2 over a 200 mm × 200 mm specimen.
- Tested an 80 W CO_2 laser on a 50 mm × 50 mm specimen using a laser power meter and thermopile sensor.
- Conducted and tested improved configurations on a Parabolic Reflector Module with IR lamps to simulate concentrated-surface heating up to 180 W/cm^2.

Activities & leadership

Project Coordinator, Astrionics (Student-led organization) — Jalandhar, India Nov 2021 – Nov 2022

- Led aerospace-related projects focused on system-level integration and analysis.
- Prepared technical documents and project plan sheets for development milestones.
- Coordinated with team members to provide technical guidance and foster a collaborative environment.
- Reported daily status to department heads to communicate workflow progress.

Publications

Journal Paper

- Comparative analytical analysis and component selection of resistojet thruster for satellite propulsion, *Journal of Space Safety Engineering*, 2024.

Conference Papers

- Leveraging Natural Language Processing and Large Language Models for Automated SysML Model Generation in MBSE, AIAA SciTech 2026 (Upcoming)
- Structural and Thermal Analysis of a CubeSat, in *Lecture Notes in Mechanical Engineering.*
- Material selection based on joule heating simulation for resistojet thruster, *Materials Today: Proceedings.*

Technical projects

- High Performance Radiant Heater Designing: Designed and manufactured HPRH module (500 mm filament length) for simulating uniform heat flux of 130 W/cm^2 over 200 mm x 200 mm specimen.
- Improvisation of Resistojet Thruster: Conducted experimental, numerical and CFD testing of improvised Resistojet thruster of 12 flow chamber configuration which resulted in higher flow stabilization.