# Yash Thummar

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## About Me

Aerospace engineer passionate about **flight dynamics, aerodynamics**, and **advanced engineering solutions**. Experienced in simulation, optimization, and AI applications for aerospace systems, with a focus on **Lean methodologies** and **project management** to build impactful improvements. Applied solutions to complex projects and drove them from initial concept through to final deployment.

## Education and Training

**Technische Universität Darmstadt** — Darmstadt, Germany
*M.Sc. Aerospace Engineering* — Nov 2024 – Present
**Lean Production Practitioner - CIP Learning Factory (PTW, TU Darmstadt):**

- Applied **Value Stream Analysis/Design (VSA/VSD)** and **Waste Walks** to identify inefficiencies and optimize a physical pneumatic cylinder production line.
- Implemented **JIT/Kanban, SMED**, and **TPM methodologies**, utilizing **Yamazumi** and **Systematic Problem Solving** to stabilize process flow and reduce lead times.

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**VIT University** — Bhopal, India
*B. Tech Aerospace Engineering* — Jul 2019 – Jun 2023
**Bachelor Thesis:**

- Developed a conceptual design of a **tiltrotor eVTOL** aircraft with **220 km/h cruise speed** and **250 km range** with a payload capacity of 4 people (400kg) and analysed using the SUAVE package and a Python programming language.
- Optimized eVTOL base design using **SciPy SLSQP optimization algorithm** that improved **aerodynamic performance by 6%**. Project Link

## Work Experience

**Bluj Aerospace Private Limited** — Hyderabad, India
*Flight Testing and Control Engineer* — Sep 2023 – Oct 2024

- **Developed Pixhawk firmware** to enable autonomous navigation on a custom airframe, utilising a **Linux development environment** and **validating performance through Gazebo** simulations.
- **Calibrated and tested a 450 kg VTOL aircraft**, successfully executing an automated mission and achieving final validation for operational flight.
- **Implemented PDI model for Veronte flight controller** for custom VTOL control and simulated in **X-Plane 11**.

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**AERO2ASTRO** — Chennai, India
*Research Intern* — May 2021 – Nov 2021

- Designed and analysed the internal structure design of cryogenic propellant tanks, and evaluated various alloys and composite materials using the **Autodesk Fusion 360 software's design and structural simulation (FEM) workspace**.

## Projects

**Visualization Tool for EASA-Compliant Vertiport Airspace** — Dec 2025 – Present

- Developing an interactive 3D tool using **Unity3D** and the **Mapbox Unity SDK** to automate the calculation and visualization of EASA-compliant obstacle-free volumes based on real-world geographic coordinates.

- Designing algorithms to optimize approach and departure corridors, integrating geospatial data to justify recommendations based on noise minimization, safety, and operational throughput.

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**Autonomous UAV Navigation and Mission Planning** May 2025 – Jul 2025

- Collaboratively developed and deployed a **C++** 360° **LiDAR-based detect-and-avoid** system using ROS2, validating **autonomous navigation** via **Gazebo/PX4 simulation** and **live flight tests** on a Quadcopter with **Raspberry Pi** and **Pixhawk**.
- **Defined the mission scope** and **conducted a formal SORA-based risk assessment** for a UAV medical delivery mission, executing the plan by implementing the 3D flight path and geofence to meet objectives.

## Publications

**Foldable Quadcopters: Design, Analysis, and Additive Manufacturing** Dec 2024

***Reference:*** Thummar, Y. H., & Alam, M. I. (2024). Foldable Quadcopters. In Unmanned Aircraft Systems (pp. 477-518). Wiley. doi.org/10.1002/9781394230648.ch12

- Designed a **Compact & Foldable CAD design** of a quadcopter using the **Autodesk Fusion 360** software and **3D printed** it using **Cura software** and the Ender 3 Pro FDM 3D printer with ABS filament.
- Programmed the **Pixhawk flight controller** using open-source software Mission Planner and added FPV system and **optical flow sensor**.
- **Validated stable flight** performance with a **1 kg payload** and **30-minute endurance** in both **GPS and GPS-denied** conditions.

## Skills

**Technical Skills**

- UAV Systems, Pixhawk, Raspberry Pi, Mission Planner, QGroundControl, Autodesk Fusion 360, Python, C++, Gazebo, Docker, Git, n8n, Matlab/Simulink, ROS2, Siemens NX, 3D Printing, Ansys Fluent, NASA OpenVSP.

**Management Skills**

- Problem Solving, Agile Methodologies (Scrum, Kanban), Project Lifecycle Management, Lean Production (VSM, SMED, JIT, TPM, Yamazumi), Risk Assessment & Management (SORA), Requirements Gathering, Stakeholder Communication, Resource & Procurement Planning, Quality Assurance & Test Case Development, Jira & Confluence, Microsoft Project, Power BI, MS Office Suite.

## Certifications

- IBM AI Product Manager Professional Certificate – Link
- Stanford University & DeepLearning.AI Machine Learning Specialization – Link
- Financial Management for Product Leaders (University of Maryland) – Link

## Leadership & Outreach

**UAV Workshop Organizer** April 2023

- **Organised and led a UAV workshop** for the SAEINDIA Collegiate Club, providing instruction on **drone programming** and conducting a live flight demonstration for student participants at VIT Bhopal University. Event Portfolio

## Languages

English (C1 Fluent), German (B1 Intermediate), Hindi, Gujarati (Mother tongue).