

Samkit Parak

Robotics Engineer | Autonomous Systems | Computer Vision

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EDUCATION

Bachelor of Science, Mechanical Engineering

Oct 2024 - Present

Karlsruhe Institute of Technology (KIT), Karlsruhe

GPA 2.1 | Focus: Robotics, Cognitive Systems, Mechanics, Computational Engineering

International Baccalaureate (IB) Diploma

2022 - 2024

Sreenidhi International School, Hyderabad

Score: 40/42 | HL: Physics, Math AA, Chemistry | SAT: 1530/1600

PROFESSIONAL EXPERIENCE

Student Assistant - Robotics & Vision

Apr 2025 - Present

wbk Institute for Production Science, Karlsruhe

- Built an Active Perception Agent, a fully autonomous robotic inspection system on a UR5e, automating the complete workflow from 3D workspace localisation to pass/fail reporting with zero human intervention after setup.
- Developed a ROS 2-based robotics pipeline using MoveIt 2, TF2, and Intel RealSense RGB-D perception for motion planning, sensor fusion, and dynamic coordinate transformations.
- Implemented YOLOv8-based object detection and depth deprojection to enable real-time 3D object localisation and autonomous viewpoint generation.
- Integrated self-hosted Vision-Language Models (Ollama + FastAPI) for semantic defect classification and automated label verification within the inspection pipeline.
- Research conducted under the DFG-funded SFB 1574 B01 programme on circular economy remanufacturing.

Autonomous Systems Engineer

Jan 2026 - Present

KA-RaceIng e.V., Karlsruhe | Formula Student Driverless

- Developing and comparing autonomous perception and localisation approaches for a Formula Student Driverless race car, including conventional SLAM and neural-network-based alternatives, using ROS 2.
- Prototyping neural-network models to evaluate whether learned methods can improve robustness over the existing SLAM-based driving pipeline.
- Integrating sensor fusion, state estimation, motion planning, and real-time components; validating performance through simulation, hardware integration, and on-track testing.

Research Intern, Product Design

May - Aug 2023

K-Lite Industries, Chennai

- Engineered lighting fixture components in Fusion 360 and PTC CREO to strict Design for Manufacturing (DFM) standards.
- Conducted thermal analysis and prototyping, contributing to an 8% improvement in LED energy efficiency.
- Validated designs through quality control stress-testing alongside senior engineers.

Data Engineering Intern

Jun - Dec 2022

Minfy Technologies, Hyderabad

- Built Python pipelines to process, validate, and curate large-scale cloud datasets - developing instincts for how data quality issues compound at volume.
- Implemented automated validation checks to detect schema inconsistencies, missing values, and distribution anomalies across data streams.
- Streamlined ETL workflows and implemented automated data validation, reducing downstream errors by 40%.

TECHNICAL SKILLS

Robotics: ROS 2, MoveIt 2, TF2, SLAM, Motion Planning, Sensor Fusion, Robot Localisation, Autonomous Systems, UR5e, Active Perception

Computer Vision & ML: OpenCV, YOLOv8, RGB-D Vision, 3D Object Localisation, Camera Calibration, Vision-Language Models (VLMs), PyTorch, Depth Estimation

Data & Programming: Python, C++, NumPy, Pandas, Scikit-learn, FastAPI, Flask, Linux, Git

CAD & Simulation: Fusion 360, PTC CREO, SolidWorks, CFD, Design for Manufacturing (DFM)

Languages: English (Fluent), Hindi (Native), German (A2 - In Progress), Spanish (Basic)

LEADERSHIP & ENTREPRENEURSHIP

Executive Director & Co-Founder

Jun 2022 - Present

Hack4Earth Hackathon

- Founded and led a global hackathon in partnership with Google and Microsoft, distributing \$230,000 in prizes to over 1,000 participants across two editions.

Co-Founder

Aug 2022 - Present

ThinkSTEAM Foundation, Telangana

- Co-founded an NGO delivering STEM education to over 800 students across 30 government schools, coordinating a team of 50 volunteers.

Lead Engineer

Dec 2021 - Present

Experimental Rocketry Project

- Designed, built, and launched 15 model rockets across six propellant formulations, applying fluid dynamics and structural analysis to optimise flight stability and aerodynamic performance.