HARISH S

sundarharish64@gmail.com +91 9450598364 Coimbatore, India Harish S

Electronics and Communication Engineering student interested in **robotics, control systems, and aerospace applications**.National awardee at **e-Yantra,IIT Bombay** and **Recognized IEEE International Robotics Competition**, with hands-on experience in **UAVs, thrust vector control, and biomedical robotics, with a strong interest in contributing to Agnikul Cosmos' vision of accessible and modular launch vehicles.**

TECHNICAL SKILL

- **Control Systems:** PID Control, Basic LQR Control.
- **Sensor Fusion:** IMU Integration, Encoder based Feedback, Inertial Navigation Systems, Sensor Calibration,
- **Robotics & Motion Control:**Trajectory Planning, Actuator Control
- **Embedded Systems:** C/C++,Arduino, PIC, ESP32, Communication Protocols (UART, I2C, SPI), Basic Real-Time Operating Systems (RTOS).
- **Troubleshooting:** Fault diagnosis, debugging, repair
- **PCB Designing:** Schematic Design, PCB Layout, Prototyping and Testing
- **Tools & Simulation:** Octave, EasyEDA, Proteus,Python (NumPy), Fusion 360.

PROFESSIONAL EXPERIENCE

e-Yantra — Robotics Intern
May - July 2025 —IIT Bombay, India

- Developed a self-balancing robot using PID control for real-time stability.
- Implemented wall-following and obstacle avoidance for autonomous navigation.
- Applied control systems, sensor fusion, and feedback mechanisms in robotic applications.

Signal Telecommunication Workshop—Internship
Dec 2023 — Coimbatore, India

- Completed internship training in Signal Telecommunication systems under the Ministry of Railways.
- Gained practical exposure to railway communication networks, Power electronics, and High voltage relay .

AWARDS & ACHIEVEMENTS

IEEE IAS R10 Robotic Competition **2025**
Taiwan

e-Yantra Summer Internship **2025**
IIT Bombay

PALS InnoWAH Competition **2025**
IIT Madras

Vidya Innovation & Incubation Centre **2025**
Tamil Nadu

e-Yantra Innovation Challenge – Awardee **2024**
IIT Bombay

PROJECTS

Thrust Vector Controlled Rocket Engine

- Designed and prototyped a thrust vector control (TVC) system for a small-scale rocket engine.
- Developing a custom flight controller using the ESP32 microcontroller, integrating real-time sensor data
- Implemented servo-actuated nozzle deflection to control thrust direction and enhance flight stability.
- Applied PID-based feedback control for precise orientation and dynamic response adjustment.

Autonomous Self-Balancing Robot with Wall-Following Obstacle Avoidance

- Designed and implemented a self-balancing robot using PID control and also basic LQR for real-time stability.
- Integrated wall-following and obstacle avoidance algorithms, enabling autonomous navigation.
- Applied control systems, sensor fusion, encoder feedback, actuator control techniques and Odometry-navigation.

Biomimetic Surgical Robot

- Developed an octopus-inspired robotic system for minimally invasive surgeries (neurosurgery, cardiac, and nerve operations) requiring precision and flexibility.
- Integrated potentiometer feedback, PID control, and I2C communication to map surgeon's hand movements into real-time robotic actuation(Haptic feedback).
- Implemented a force-sensing gripper with embedded controllers (Raspberry Pi, ESP32, Arduino) to monitor and regulate tissue cutting force, improving safety.

SevvaiVahana – Autonomous Drone for ISRO Project

- Developed an autonomous drone system for lift-off, hovering, waypoint navigation, sequential landing, and automatic return-to-home, designed for GPS-independent operations.
- Implemented path planning algorithms, LiDAR-based mapping, and image processing techniques to ensure shortest path optimization and obstacle avoidance.
- Integrated Raspberry Pi, ESP32, and encoder feedback for precise motion control and real-time decision making.

EDUCATION

B.E Electronics and Communication Engineering
KIT-Kalaignar Karunanidhi Institution of Technology
Nov 2022 – May 2026 — Coimbatore, India

Shree Ramana Vikas Higher secondary school
Jun 2021 – Apr 2022 — Sivagangai, India