Day - 12

SmoothNav

Date : 11/07/2025

Duration : 24 Hours

Challenge Brief

Obstacle-avoiding robots are critical in fields like automation, delivery, and surveillance. However, basic implementations often suffer from noisy sensor readings (especially with ultrasonic sensors like HC-SR04), leading to jittery movement and poor decision-making. Smooth navigation requires both noise-filtered distance readings

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Objective

Build an Arduino-powered robot that:

- Uses an **HC-SR04 ultrasonic sensor** for obstacle detection.
- Implements a filter to smooth out sensor data.

- Displays data and decisions on a **Serial Monitor**.

General Guidelines

Filter sensor data before using it for control logic.

Monitor system behavior using **Serial.print** for debugging.

Design for smooth transitions, not just “stop and turn”

Tune constants of the algorithm manually using trial and error.

Deliverables

Arduino Code implementing:

- Sensor filtering
- Obstacle detection and motion adjustment

Tinkercad circuit simulation link

Video demo or screenshots of code behavior

Documented code with comments explaining each major section

Evaluation Criteria

Criteria	Description
Sensor Stability	Filtered readings with minimal fluctuation
No Collisions	Robot never crashes into objects
Code Quality	Clear structure, good use of functions and comments
Extra Features	LCD display, LEDs, sound feedback, etc. (bonus)

TECH AFFAIRS
IIITDM

Addition resources or dataset if required

https://www.tinkercad.com/

Support

For any queries, reach out to:

Email: robotics@iiitdm.ac.in

Name & contact: Dhanvanth Saravanan
8667006465

WhatsApp Community: https://chat.whatsapp.com/CEjhrp1QolYLs1m4OgslMT

Submission

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