EXPERIMENT 5: STAIRCASE DETECTION ROBOT

Objective

The objective of this experiment is to create an Edge Detection Robot using the Chelonia Bot. The robot should autonomously navigate its environment by detecting obstacles with HC-SR04 ultrasonic sensors.

Setup

For this experiment, there is a slight modification in the main hardware connection diagram. Please refer to the updated connection diagram from the link: Hardware connection new

 Ensure that the Chelonia Bot to Arduino IDE connection remains the same as explained in Section 2.3. This modification in the connection diagram is crucial for the proper functioning of the Edge Detection Robot. It optimizes the integration of HC-SR04 ultrasonic sensors for accurate obstacle detection.

Please follow the provided link to access the revised connection diagram before proceeding with the experiment.

Hardware Setup

Motor Connections

Motor A (Left Motor):

Input 1 (MLa): Connect to pin 8.

Input 2 (MLb): Connect to pin 9.

Motor B (Right Motor):

Input 1 (MRa): Connect to pin 10.

Input 2 (MRb): Connect to pin 11.

IR Sensor Connections

Sensor 1:

 Connect to pin 2.

Sensor 2:

 Connect to pin 6.

In case you encounter any uncertainties during the hardware setup, we recommend watching the video tutorial available at the following link: video

Code Example: **Edge detection robo**

Usage Instructions

Ensure the Edge Detection Robot is placed in an environment with obstacles.

Observe the robot's autonomous navigation based on the ultrasonic sensor readings.

Adjust the robot's response to obstacles by modifying the code logic.

Expected Results

The Chelonia Bot should autonomously navigate, avoiding obstacles based on the readings from the HC-SR04 ultrasonic sensors.

Frequently Asked Questions (FAQs)

Q: How does the robot detect obstacles?

A: The HC-SR04 ultrasonic sensors are used to measure the distance between the robot and obstacles. The robot reacts based on the sensor readings to avoid collisions.

Q: Can I customize the robot's response to obstacles?

A: Yes, you can modify the code to change the robot's behavior in response to obstacles by adjusting the logic in the loop () function.