

EXPERIMENT 25: MAZE SOLVING ROBOT

Objective:

The Maze Solving Robot is designed to autonomously navigate through a maze by utilizing ultrasonic sensors for obstacle detection and maneuvering. This user manual provides step-by-step instructions for setting up, operating, and troubleshooting the maze-solving robot.

Setup:

- **Ultrasonic Sensors:**
 - Connect the left ultrasonic sensor's trigger (Trig) pin to digital pin 2 and echo (Echo) pin to digital pin 3.
 - Connect the front ultrasonic sensor's trigger (Trig) pin to digital pin 4 and echo (Echo) pin to digital pin 5.
 - Connect the right ultrasonic sensor's trigger (Trig) pin to digital pin 6 and echo (Echo) pin to digital pin 7.
- **Motors:**
 - Connect the left motor control pins (LEFT_MOTOR_IN1 and LEFT_MOTOR_IN2) to digital pins 8 and 9, respectively.
 - Connect the right motor control pins (RIGHT_MOTOR_IN1 and RIGHT_MOTOR_IN2) to digital pins 10 and 11, respectively.
- **Install Required Libraries:**

Install the necessary libraries by download the link: [Arduino NEWping.h library](#)

Code Example: [Maze Solving Robot](#)

Upload the provided Arduino code to the Arduino board. The code uses ultrasonic sensors to detect obstacles and navigate through a maze.

Usage Instructions:

- **Power On:**
 - Power the robot and ensure it is connected to the Arduino.
- **Ultrasonic Sensor Distance Measurement:**
 - The ultrasonic sensors will measure distances using the trigger and echo pins.
 - Distances will be displayed on the serial monitor.
- **Maze Solving:**
 - The robot will autonomously navigate through the maze.
 - If an obstacle is detected in front (within 20 cm), the robot will decide whether to turn left or right based on the distances measured by left and right ultrasonic sensors.
 - The robot will move forward if no obstacle is detected.

Expected Results:

- The maze-solving robot should autonomously navigate through the maze, avoiding obstacles in its path.

FAQs:

Q: How can I interpret the ultrasonic sensor distances?

A: The distances are displayed on the serial monitor. Ensure the robot can detect obstacles at reasonable distances.

Q: What should I do if the robot does not navigate as expected?

A: Check the hardware connections, ensure the sensors are functioning, and review the code for potential issues.

[Maze solving reference video](#)