

WALL•I ROBOT

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Introduction

The goal of this project was to make a moving robot which evades obstacles, plays sounds and has a LED indicator.

Objectives

The primary objective included robot's movement and ability to detect and evade obstacles.

Secondary objectives included robot's sounds and LED indicator. Robot plays the sound 1 at startup and the sound 2 when an obstacle is detected.

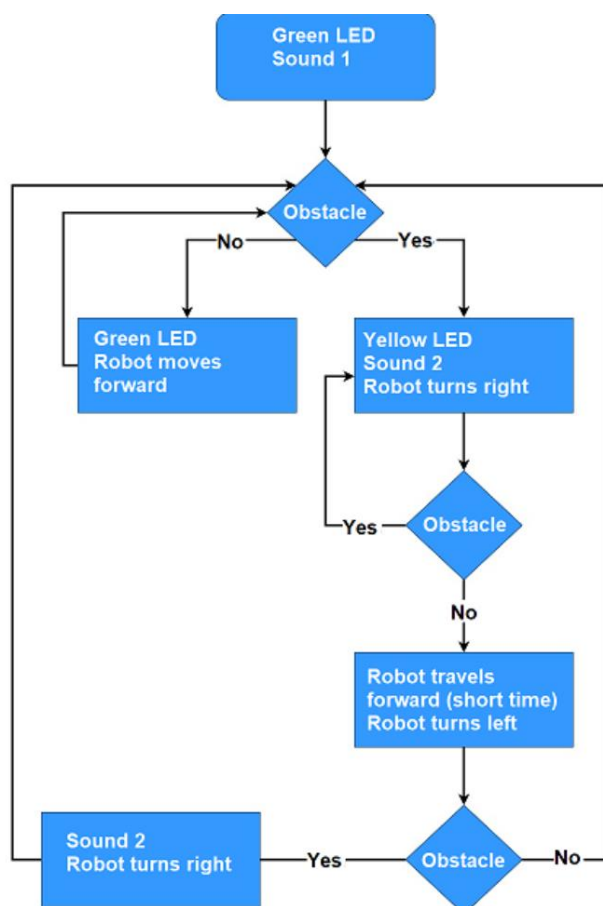


FIGURE 1. The Activity Diagram

Methods

The robot starts by reading a distance value with HC-SR04 sensor. Based on the distance value, if there's no obstacle the robot moves forward, and the green LED is ON. When the HC-SR04 sensor detects an obstacle, the yellow LED switches ON and the robot starts the evading sequence (figure 1).

The microcontroller used in the project was Arduino Uno. Obstacles were detected with HC-SR04 ultrasonic sensor. The rotation direction of the DC motors were controlled with L298N motor driver. Sound was produced with small portable speaker and microSD-card reader module. Robot was powered by 12 V power supply.

Results

The robot worked exactly as expected. The robot successfully detects obstacles and executes corresponding functions based on the distance value given.

Sounds play without interference and LEDs signify the corresponding function that robot is processing.

Conclusions

The project was successful.

When reading the distance value from the HC-SR04 sensor, the sensor sometimes takes interference and gives out false reading. This was fixed by calculating the average value from 3 consecutive readings.

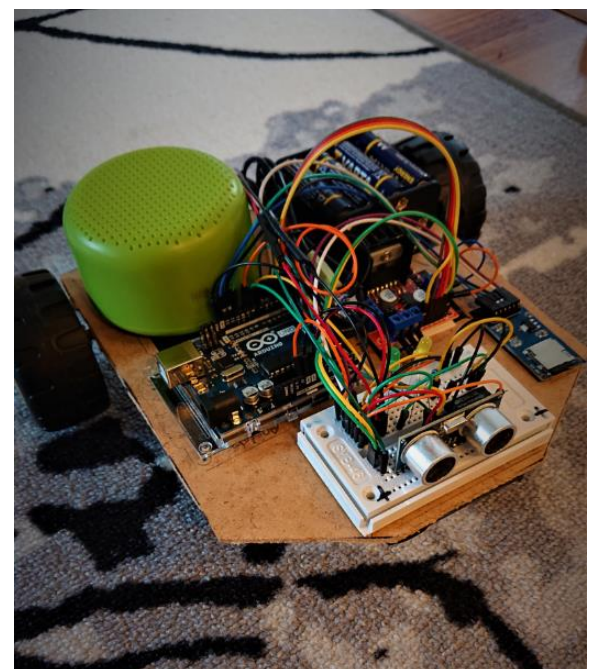


FIGURE 2. The WALL•I robot

References

1. L298N datasheet Source: <http://www.handsontec.com/datasheets/L298N%20Motor%20Driver.pdf>
2. HC-SR04 sensor datasheet Source: <https://cdn.sparkfun.com/datasheets/Sensors/Proximity/HCSR04.pdf>
3. MicroSD-card reader module datasheet Source: <http://datalogger.pbworks.com/w/file/89507207/Datalogger%20-%20SD%20Memory%20Reader%20Datasheet.pdf>