Automated Obstacle Detector and Path Changer

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Abstract: Utilizing a sensor, this device utilised to keep an eye on the house. All sensor data is transferred to Thingspeak's IoT cloud, where it is shown graphically. We upload the value to a Thingspeak cloud using an Arduino Uno microcontroller and esp8266 wifi. The following sensors are used in this project: a gas sensor, an LDR sensor, an ultrasonic sensor, a metal sensor, a fire sensor, a DHT 11 sensor, and a robot setup. If there is an environmental issue in the home, the sensor will sense the issue and upload the data to the cloud. The robot's distance can be determined using an ultrasonic sensor. The metal sensor is a small piece of metal that is found in homes. If it is activated, it detects fire, and the pump motor pumps water at the same value that is reported to the IoT cloud. The DTH 11 sensor measures the temperature and humidity in the house. In this project, normal robot setup robots are also employed on the left, right, forward, and backward sides.

Keywords: Auduino, Controller, Robotic Car, Senor, Servo motor, Thingspeak

Introduction

In this paper, we measure the humidity, temperature, gas level, fire, light intensity, metal, and distances of a robot. All used and measured information are transferred to Thingspeak's IoT cloud. Normally, we don't measure environmental activities at home. This project's buzzer will sound constantly if a sensor reading is abnormal. Using a sensor, this method utilized to keep an eye on the house. All sensor data is transmitted to Thingspeak's IoT cloud, where it is shown graphically.

Proposed System

- Robots and sensors are used in this system to measure the indoor environment.
- The sensor reading is kept in an IOT cloud.
- If an obstruction is found, the robot automatically travels forward and rotates to the right.

The methodology

In this research, we used six different kinds of sensors to gauge the home's ambient conditions. The sensor provides input to relay boards, microcontrollers, buzzers, and robot configuration. The sensor detected value is uploaded to the IoT cloud utilising Wi-Fi. The pump motor is controlled by the relay board.

Hardware Requirements

- Arduino Uno
- NodeMcu esp8266
- DHT 11 sensor
- Ultrasonic sensor
- Metal sensor
- LDR sensor

- Gas sensor
- Fire sensor
- Relay board

Software Requirements

- Arduino IDE
- Thingspeak application

I. The controller can take up to 2 motors. Plug one motor into the terminal labelled OUT1 and OUT2. Plug the second motor into the terminal labelled OUT3 and OUT4:

II. The row of pins on the bottom right of the L298N control the speed and direction of the motors. IN1 and IN2 control the direction of the motor connected to OUT1 and OUT2. IN3 and IN4 control the direction of the motor connected to OUT3 and OUT4. Here I plugged them into pins 2, 3, 4, and 5 on the Arduino.

III. You can power the L298N with up to 12V by plugging your power source into the pin on the L298N labelled "12V". The pin labelled "5V" is a 5V output that you can use to power your Arduino. Here are some ways to wire it depending on your use case:
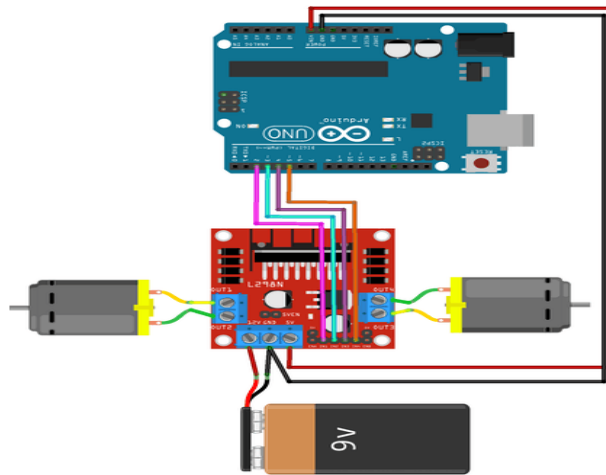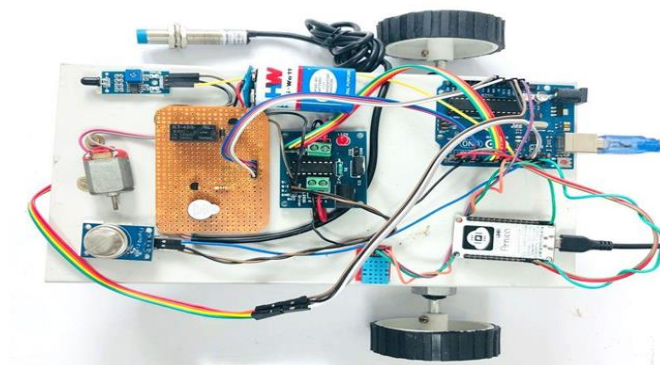

Figure 1. Circuit Diagram

Figure 2. Prototype

Results and discussion

The system was put to the test by putting various items in its path at a distance. Given that the obstacles were placed in various locations, the sensor's detection was counted. This study presents a straightforward, reasonably priced obstacle detection and avoidance system. One sensor, in conjunction with a servo motor, was utilised to identify impediments. The least likelihood of failure and accuracy percentage were discovered.

Conclusion

The system demonstrates that it is capable of avoiding obstructions, avoiding collisions, and shifting its position. One could argue that more functionality could be added to the design to carry out different tasks and reduce stress in people. The project will benefit the nation's security, defence and environmental sectors, as well, in the end.

REFERENCES

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