OBSTACLE AVOIDANCE ROBOT

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ABSTRACT

The obstacle avoidance robot vehicle is used for detecting the obstacle and avoiding the collision.The design of obstacle avoidance robot requires the ultrasonic sensor to detect the obstacle and determine its distance. The sensor module is mounted on a servo motor which is placed in front of the vehicle and is used to change the direction of the robot. The robot gets the information from the surrounding area, through the mounted sensors on the robot.The motor driver module and four-wheel dc motors are used for the movements of vehicle like forward, backward, left, right and stop. A microcontroller Arduino Uno is used to control the vehicle and to achieve the desired detection and avoidance operation. . Some sensing devices such as bump sensor, infrared sensor and ultrasonic sensor can be used for detection but here we have chosen Ultrasonic sensor which has high ranging capacity and low cost.

Keyword : *- Arduino UNO, motor shield L293d, ultrasonic Sensor HC-SR04, DC Motor, servo motor and power supply.*

I Introduction

The project proposes Robotic vehicle that has an intelligence built in it such that it Directs itself whenever an obstacle comes in its path. This project is designed to build an obstacle Avoidance robotic vehicle using ultrasonic sensors for its Movement. This Robotic vehicle is built, using a micro-controller Family. A microcontroller is used to achieve the desired operation. An ultrasonic sound waves uses to measure the distance to an object by measuring how long it takes the pulse to bounce off the object and return to the sensor which is used to detect any obstacle ahead which sends a command to the micro-controller. Depending On the input signal received, the micro-controller redirects the The Robot to move in an alternate direction by actuating the motors which are interfaced through a motor driver. Some of the Project is built with IR sensors which has its own application. In Our project those application is not compactable so we are using Ultrasonic sensor. We proposed a robot which avoids the obstacle and it can be used for many industries to lift heavy components from one place to another place which is not possible without the help of machines. From this we have got an idea to introduce the robot named as “Obstacle avoidance robot” using Arduino UNO. Obstacle avoidance Robot is designed to allow robot for navigating in unknown environment by avoiding collision. The best part of our project is, “If any obstacle is encountered by the robot, it Automatically stops and diverts.

II Existing system

• It has two wheels only

• It is used for short distance only.

DISADVANTAGE OF EXISTING SYSTEM

• The existing system has only two wheels which has drawbacks in the vehicular motion because of the two wheels makes the move in difficult manner and it causes difficulty in moving hard and soft surface. So, this is the main drawbacks of the reference model.

III PROPOSED SYSTEM

• The existing system consists of only two wheels but we have developed our project with four wheels

• It runs more efficient in both hard surface and soft surface.

• We are developing the project with low cost and with high working capacity than the pre- existing setup

IV BLOCK DIAGRAM

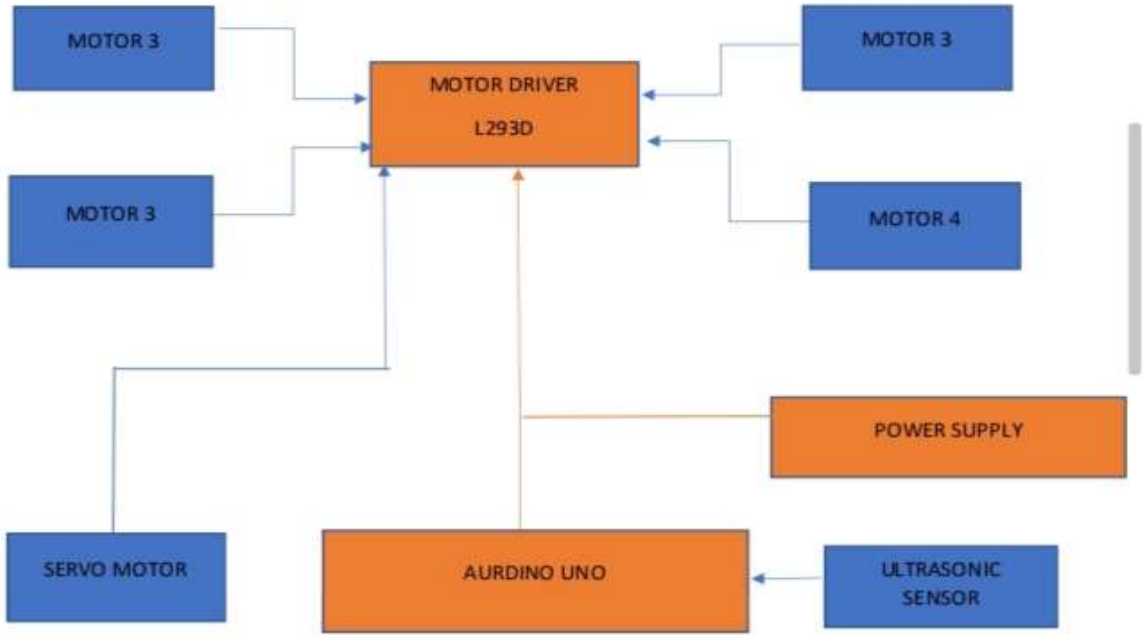

Fig -1:BLOCK DIAGRAM

V METHODOLOGY

- The purpose of this project is to develop a robot with an obstacle avoidance capability.
- The robot will be built as a fully autonomous vehicle with onboard sensor to get information about the surrounding environment.
- The robot is an four wheeled robot platform.
- The robot has an ultrasonic sensor which is mounted in the front of it to scan the front environment.
- The ultrasonic sensor will trigger a signal to the microcontroller which is an Arduino UNO when detect the obstacle in the path.

VI EXPERIMENTAL RESULT

Finished Experimental setup of OBSTACLE AVOIDANCE ROBOT

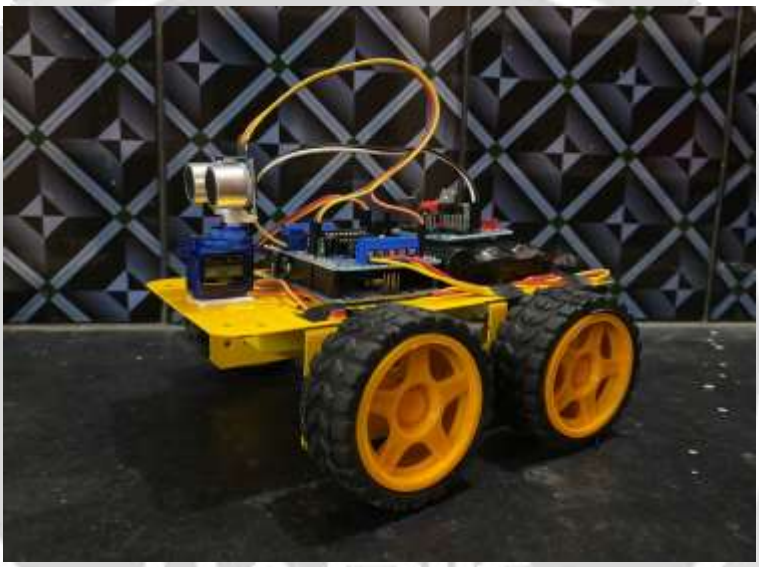

Fig -2: Right side view of OBSTACLE AVOIDANCE ROBOT

Fig -3: Front view of OBSTACLE AVOIDANCE ROBOT

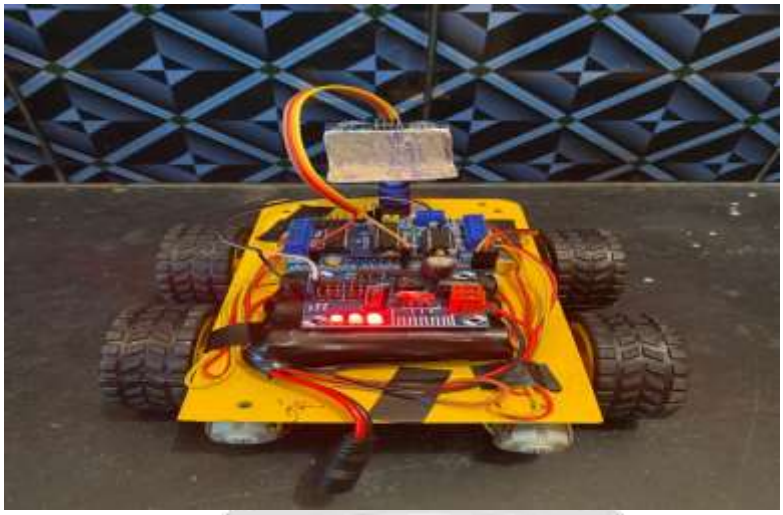

Fig -4: Top view of OBSTACLE AVOIDANCE ROBOT

Fig -5: Left side of OBSTACLE AVOIDANCE ROBOT

VII CONCLUSION

Today we are in the world of robotics. Knowingly or unknowing, we have been using different types of robots in our daily life. The project "OBSTACLE AVOIDANCE ROBOT" is practically proved by using the ultrasonic sensor for sensing of robot, motor shield drive for the driving the dc motor, is used for the movement of the robot with the help of the Arduino microcontroller. The robot is fully autonomous and after the initial loading of the code, it requires no user intervention during its operation. When the Obstacle Avoidance Robot is placed in the unknown environment with obstacles, it moves by avoiding all obstacles with considerable accuracy.

VIII FUTURE SCOPE

- In future, this project can be enhanced by connecting Bluetooth module and Camera, so that the user can see the detected obstacle on his screen by sitting at one place.
- Firefighting robot: By adding temperature sensor, water tank and making some changes in programming we can use this robot as firefighting robot.

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