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Arduino based cleansing robot

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Abstract

Usually robots have been used in industries, companies and all for reducing the work of the people. People for whom there are not in good health condition. The aim of the project is to reduce the burden of the people along with work and time. The purpose of the product is to clean the entire floor by dusting. The components we used here is Arduino ATMEGA 2560, Vertical limit switch, High torque motor, Ultrasound sensor and for dusting purpose vacuum motor is used. These Robot can also detect the obstacles and move in reverse direction using the concept of H bridge. Our cleansing robot will help us to remove the dust from the floor and reduce the work and to save the time of the people.

Keywords: Atmega, cleansing, Robots, microcontroller, technical skills, Control and Automation

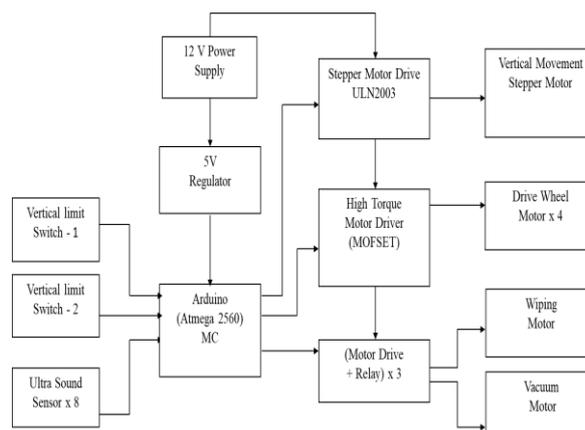
1. Introduction

In the past years, people need to do their work all alone even if their health condition is not good for doing the work. There was no other option for them to complete their work. In the recent years, technical skills and thoughts evolved new ideas. For these they introduce a new product which fulfil the human activities and it was ed as "ROBOTS". Usually the robots are used in industries instead of humans where people cannot work due to hazardous environment. Here we are introducing a cleansing robot which will help the people for cleaning purposes. It can move horizontally and vertically, and if any obstacles are present in the front of the robot they can detect the obstacles and reverse the direction using H bridge concept. It is an easily usable project for all people. It removes the dust particles from the floor using vacuum motor.

2. Advantages

- Saves the time
- Can be recharged and reused
- No high voltage required
- Options for manual mode also
- Reduce the work pressure
- It can be used easily

3. Block Diagram



4. Methodology

Here Vertical limit switch and ultrasound sensor is given as the input. And this is directly given to Arduino, we are using here ATMEGA 2560. Normally we are providing a 12V supply but Arduino uses only 5V so we use a battery backup here and the 5V is given to Arduino. We provide a RF module which has a transmitting and receiving signal and it is for manual remote control. High torque motor is used for movement. A relay is used here for switching mechanism. Wiping motor is used to wipe the floor. Dusting motor is used to remove the dust. Vacuum motor is used here to create a suction

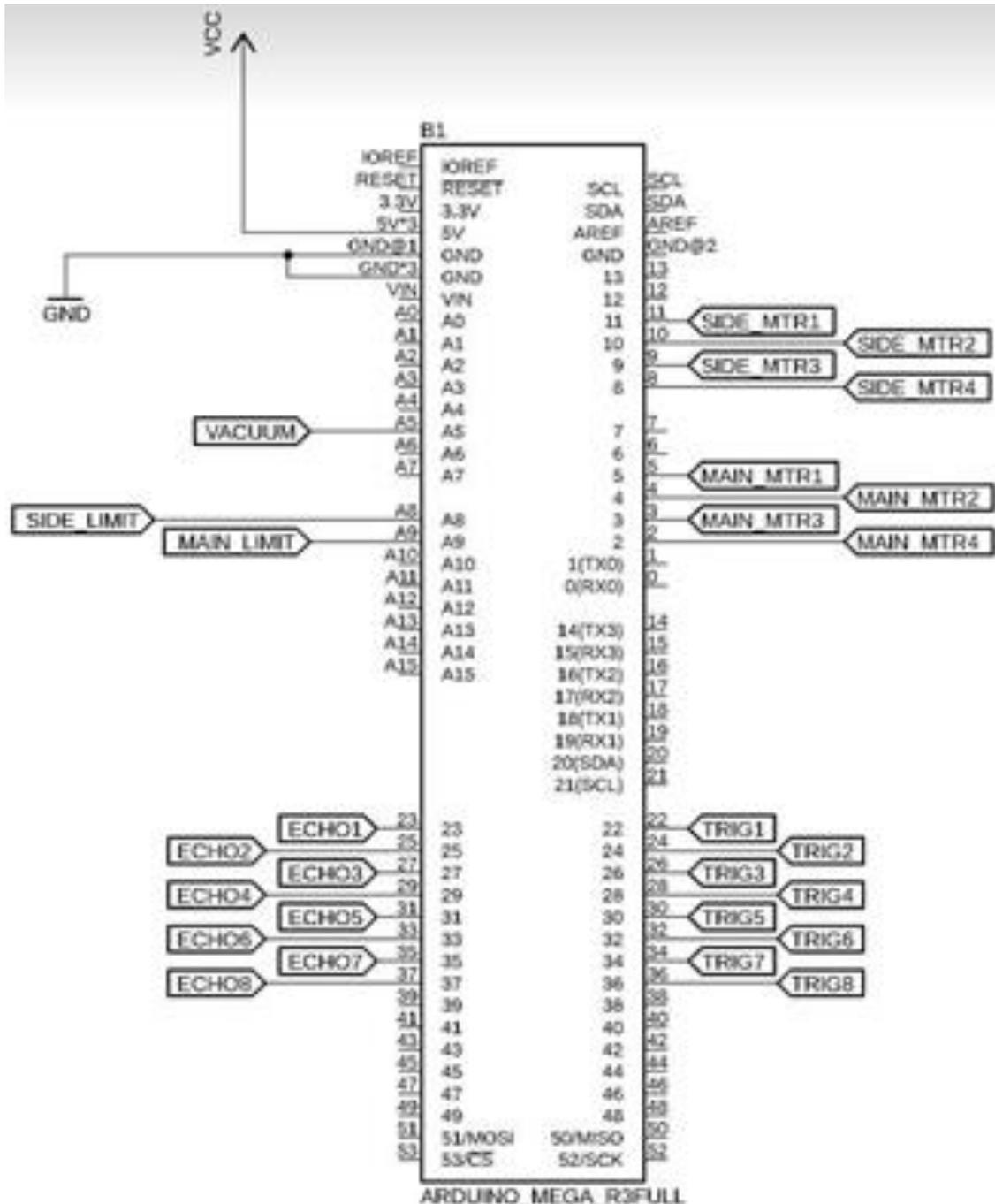
5. Components

5.1 Limit Switch

Here vertical limit switch protect the device from external forces. And also it helps to detect the presence and absence of the obstacles while moving. They defines only a limit while moving. It changes its signal to a digital low when an external force touch the switch. They are contact switches. It detects the position in one direction.

5.2 Atmega 2560

The Arduino ATMEGA 2560 is a microcontroller. It has a total of 54 pins. And 30 external force touch the switch. They are contact switches. It has 54 digital pins and 16 analog pins.



5.3 Ultrasound Sensor

It detects the obstacles and measure the distance between the obstacle and the sensor. Ultrasound sensor is used to detect any obstacle the is present in front of the robot. They

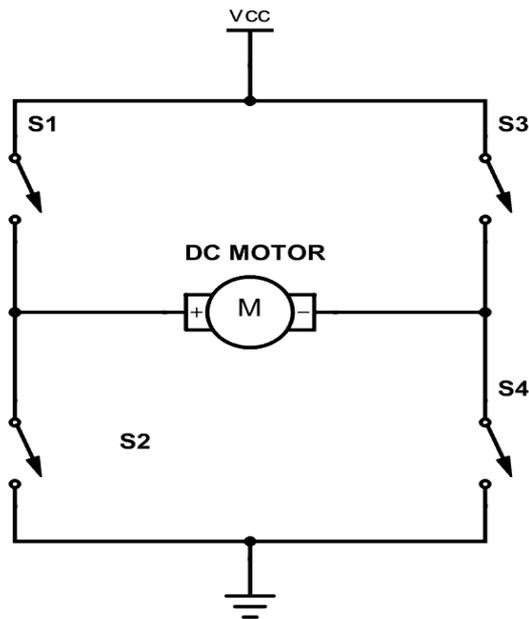
can detect the measuring distance from 2cm to 80cm. We use here a 5V 15 ampere 40 hertz ultrasound sensor. They have echoing and triggering pins in them. Eight ultrasound sensor are used here.

5.4 High torque motor

Here we use a 12V 19 rpm 10 ampere 2.9 Nm high torque motor. High torque motor is used for the movement of the motor. It provides a high starting torque and inertia. Inertia is a process by which an object is in rest. It is a high speed motor.

5.5 H-bridge

An H-bridge is an electronic circuit that switches the polarity of a voltage applied to a load. These circuits are often used in robotics and other applications to allow DC motors to run forwards or backwards. So the H-bridge is used here for the reverse movement if an obstacle is present somewhere through the movement.



5.5 Vacuum motor

This motor absorbs the dust particles from the floor and they collect them in the dust bag. It is one of the important component of our robot. They takes the electrical power from the source and converts into mechanical power. It is used here for dusting purpose.



Fig 1: This is the base model of our project

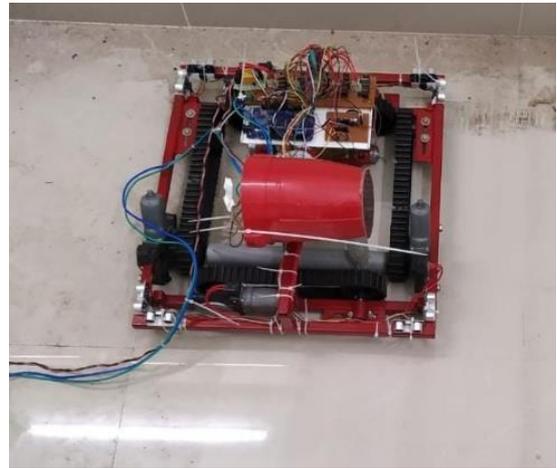


Fig 2: This is how the final presentation looks like

6. Conclusion

By our project we are trying to reduce the burden of some peoples and for consuming time. Here we are using a floor cleaning machine so that it will be easy to handle it and also saves time and will work automatically for cleaning purpose at homes and offices. For unhealthy and sick people it will be very useful. And for the cleaning purpose there is no need for any servants and also they can save money.

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