

Solar Powered Floor Cleaning Robot

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ABSTRACT : This project aims to develop a non human guidance solar-powered unmanned cleaning robot (SPUCR) and to collect dust. The SPUCR is equipped with a Bluetooth module and dry-cleaning technology controlled by the Bluetooth-based android application. After completing the cleaning process, the user receives a notification to the registered mobile phone via Bluetooth. The advantage of the device is the cleaning process is done in quickly compared to a manual cabled vacuum cleaner. It is portable, flexible, time-saving, and power efficient. Its applications are not limited to house cleaning, but also are very useful in food industries, barber shops, in parks to collect falling leaves or any surface that the DC motor can move on. . The motive of this project is to design and implement a Vacuum Autonomous Robot. The vacuum Cleaner Robot is designed to make the cleaning process become easier rather than using a manual vacuum. The main purpose of this project is to implement and design a vacuum robot prototype. The vacuum Robot will have several criteria that are user-friendly.

1. INTRODUCTION

Robot is an intelligent device having its own brain fed with computer logic so that it can do the work according to the algorithm designed. Autonomous movement of vehicle is guided by the logic controller designed. Robots plays an important role in every field of life. It is used in industries, in households and in institutes. The robots are just becoming as intelligent as human now a days. Mostly an average human uses 2-3 robots per day in his day-to-day life. Various robotics parts are: - Pneumatic devices Actuators sensors mechanical control devices like valve Microcontroller – Controlling unit Mechanical control devices are used to control the flow or movement of materials or any other parts present in the device. Actuators are used for controlling a mechanism which ultimately controls a part of the device. Sensors are the sensing devices which transmit a signal and receives the signal and accordingly used to accumulate the various environment information which is ultimately fed to microcontroller for deciding the working of machines. Microcontroller is the brain of robot where

program is written and sensors are connected as input and actuators as output. The controlling of the robot is governed by various algorithms like fuzzy controller, machine learning based practices and artificial neural network-based algorithms. Depending upon the environment value received to the controller it eliminates the error and transits from one state to another. Basically, there are two types of controllers, one is continuous controller and another is PID based controller.

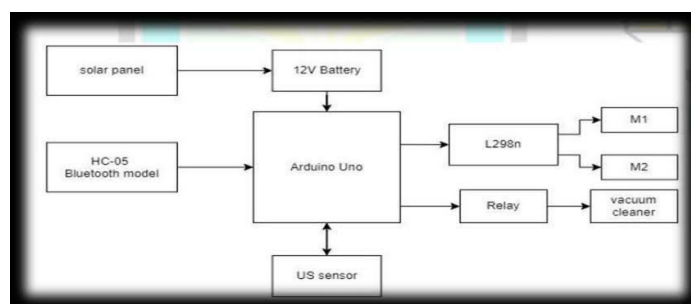
Continuous controller is more direct and less effective while PID controller is more advanced and varies according to the current state and gives efficient result. Acknowledgements, References, Appendix. Collate acknowledgements in a separate section at the end of the article and do not include them on the title page, as a footnote to the title

or otherwise. Bulleted lists may be included and should look like this:

2. METHODOLOGY

First it checks if it's on manual mode. If yes, then it checks the keypad. On keypad it checks if any key is pushed, i.e., Left, Right or Centre. If yes, then the data is displayed accordingly on the LCD screen, i.e., our mobile phone which we are using as a remote to control the robot manually. The data is transmitted to the bot. Then it checks if any hurdle is detected. If yes then the signal is displayed and the robot is informed to stop and it goes back to manual mode. If no hurdle is detected, the robot checks for the data signal received. If the data signal is received, then it starts decoding the data and is displayed on the LCD. If the data signal is not received then it goes back and checks for the data signal transmitted.

3. BLOCK DIAGRAM



In this system the ultrasonic sensors are used to sense the obstacles. Ultrasonic sensors emit sound scopes with frequency lying in ultrasonic spectrum (20KHZ), which is inaudible to human ears. The sound waves hit the obstacle and bounces back to detectors. The ultrasonic sensor is used for detecting objects/obstacles and move the direction of the robot. GSM module is used by the blind person to contact to mobile numbers stored in the microcontroller in case of any emergency. Using GSM technology robot movement will be controlled. And using ultrasonic obstacle avoidance will be done. Here an Arduino Uno is used as microcontroller. Circuit consists of a GSM module, an ultrasonic Sensor, two L293D driver ICs, two motors, a cleaner and an LCD Display. The ultrasonic sensor triggers and echo pins are connected PWM of Arduino respectively. The virtual terminal represents the GSM Module. The RXD and TXD of GSM module is connected to TXD and RXD of Arduino. Motor driver IC (L293D) for driving the two motors is connected in such a way that the IN1 & IN2 for driving motor 1 and motor 2 are connected L293D is connected to motor 1 and OUT3 & OUT4 are connected to motor 2 LCD is interfaced in such a way that RS, E, D4-D7 of LCD is connected.

COMPONENTS

HARDWARE REQUIREMENTS

SOFTWARE REQUIREMENTS

STM 32 Embedded C :

Use of embedded processors in passenger cars, mobile phones, medical equipment, aerospace systems and defense systems are widespread, and even everyday domestic appliances such as dish washers, televisions, washing machines and video recorders now include at least one such device.

H-Bridge Arduino Suite :

We can better control our motor by using transistors or Field Effect Transistors (FETs). Most of what we have discussed about the relays H-Bridge is true of these circuits. You don't need diodes that were across the relay coils now. You should use diodes across your transistors though.

DC MOTOR Arduino IDE :

A DC motor relies on the fact that like magnet poles repels and unlike magnetic poles attracts each other. A coil of wire with a current running through it generates an electromagnetic field aligned with the centre of the coil. By switching the current on or off in a coil its magnetic field can be switched on or off or by switching the direction of the current in the coil the direction of the generated magnetic field can be switched 180°.

Ultrasonic Sensor :

The HC-SR04 ultrasonic sensor uses sonar to determine distance to an object like bats or dolphins do. It offers excellent range accuracy and stable readings in an easy-to-use package. Its operation is not affected by sunlight or black material like Sharp rangefinders are (although acoustically soft materials like cloth can be difficult to detect). Similar in performance to the SRF005 but with the low-price of a Sharp infrared sensor

Relay :

It is an electromagnetic device which is used to drive the load connected across the relay and the o/p of relay can be connected to controller or load for further processing.

4. CONCLUSION

These graphene vacuum cleaners will satisfy the great demand in an economy of household and industries. The multi-functions like purifications, solar energy harvesting, desalination, absorption will deserve a major place in domestic industries. Future technology may focus on graphene to convert these electronic devices into more flexible which can be compact, foldable and portable. Thus vacuum cleaners can be more favorable when manufactured with graphene and operated with graphene batteries.

5. REFERENCES

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