Solar Powered Vacuum Cleaner

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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.**

Index Terms— **Automated, SPUCR, Vacuum Cleaner, Renewable, Robot, application of android.**

INTRODUCTION

A solar-based floor cleaner robot that makes cleaning outdoor spaces, terraces, open restaurants, large campuses, etc very easy. The system is made to help cleaners clean large open spaces without any physical effort and without the need to constantly charge the robot. The robot is built to help in daily cleaning tasks and simplify them. It brings together dry operation using a vacuum cleaner. The robot is controlled by a WI-FI based android application. The remote is used by the user to send movement commands to the robot. The robot uses a battery that is constantly charged by a solar panel as it is drained by the motors. This provides a longer battery life when it is exposed to sun rays. The robot is built to help in daily cleaning tasks and simplify it. It brings together dry operation using a vacuum cleaner. The robot is controlled by an WI-FI based android application. The remote is used by user to send movement commands to the robot. The robot uses a battery that is constantly charged by a solar panel as it is drained by the motors. Sometimes we assigned people for purpose of cleaning and pay money and sometimes cleaning is required in areas where presence of living being dangerous so we cannot assigned living being in every place. Some places are so that have a large floor areas in that place for cleaning purpose we need more than one person so we required some technique to compensate this problems. The solar panel use sunlight to generate the direct current. The solar panel can operate with different voltage and current levels. There is no negative impact for the system as it collects the clean renewable energy in the form of sunlight then convert it into electricity. Automation is a great solution of this problem. So we make an autonomous floor cleaning robot. At times we allocated individuals for reason for cleaning and pay cash and once in a while cleaning is needed in regions where presence of living being hazardous so we can't relegate living being in each spot. A few spots are so that have a huge floor territory in that place for cleaning reason we need more than one individual so we required some method to repay these issues. Vacuum cleaner robot cleans the home or office even in the absence of humans. Vacuum cleaner robot cleans minute dust particles which cannot be noticed by humans. The conventional vacuum cleaner system consists of large electrical and mechanical parts which are more expensive. It uses AC power consumption. This led to the invention of small vacuum cleaner robot. The small vacuum cleaner robot uses DC power and is of less cost
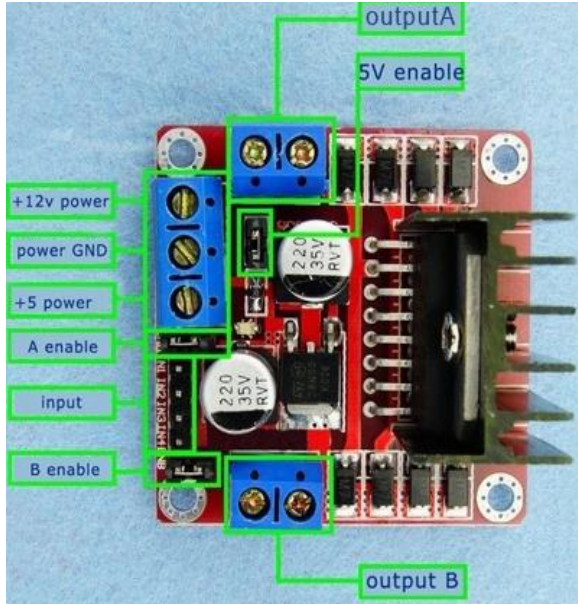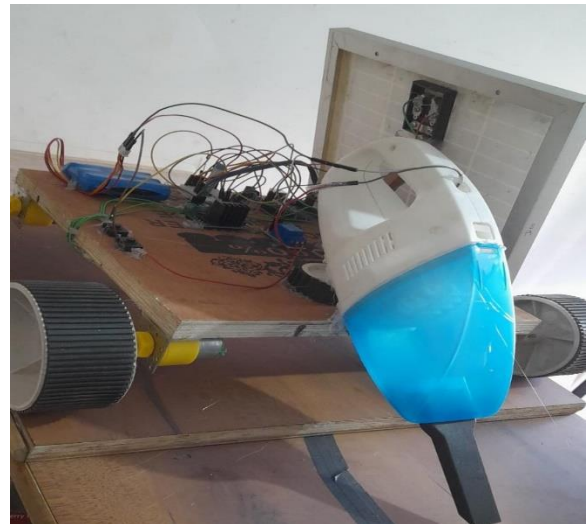
LITERATURE REVIEW

In [1], the robot is controlled by an android app with four main functions i.e moving front, back, left and right. The main components are relay module, Bluetooth, L298 motor driver module, Motors.

The survey paper [2] is a vacuum cleaner that is controlled by an android app by using a Bluetooth module. It has a special crystal circuitry that operates on the speed of the vacuum cleaner.

In [3] the main motive of the robot is to implement dry cleaning and is controlled by an android app. It has a dual mode i.e. automatic mode and manual mode and uses Atmega328P.

The main motive of this robot in [4] is to ensure dry cleaning through a Bluetooth module. It uses an Arduino Uno for improving the performance of the system.

The vacuum cleaner in [5] is the one that uses an Arduino for collecting dust through a vacuum sensor. It is monitored by using laptop with GUI in Visual Studio via Bluetooth connectivity.

In [6], the vacuum cleaner uses an Arduino for implementing the cleaning process. It has special rotating mechanism with brushes attached to it unlike other vacuum cleaner for an efficient cleaning process. The vacuum cleaner on the other hand [7] aims on both mopping and collecting dust for obtaining a clean environment. It has a L298 Motor driver IC for controlling two DC motors simultaneously in any direction.

In [8], this vacuum cleaner uses an Arduino module and it can work on both manual and automated mode. The vacuum cleaner aims on both mopping and collecting dust and is monitored through an android app. It has a DC Geared Motor for high speed and laser TOF sensor to efficiently detect obstacles.

This robot of [9] aims on both mopping and collecting dust and uses an Atmega328 module.

In [10] is monitored through a Bluetooth module for dry floor cleaning. It has a special feature i.e. voice appliances which has not been implemented in most of the vacuum cleaners.

In [11], the robot uses an AT89C52 microcontroller for floor cleaning. It uses an android application called the BT Simple terminal to control the robot.

The vacuum cleaner [12] uses Raspberry pi for collecting dust through a vacuum pressure sensor. It has a raspberry pi webcam for image processing and also Air purifier for killing harmful microbes.

SCOPE OF PROJECT

The purpose of this project is to design and implement a Vacuum Cleaner which runs on solar energy and is operated by mobile application and uses machine learning algorithms to clean. This smart vacuum cleaner cleans both dry and wet floor as well. Its main objective is to maintain and keep your surroundings clean. Solar energy is quite cost effective and saves billing. Solar energy is an integral source of energy that makes optimum utilization of the nature and store it widely so that it can be used in the night time without any kind of additional hassle.
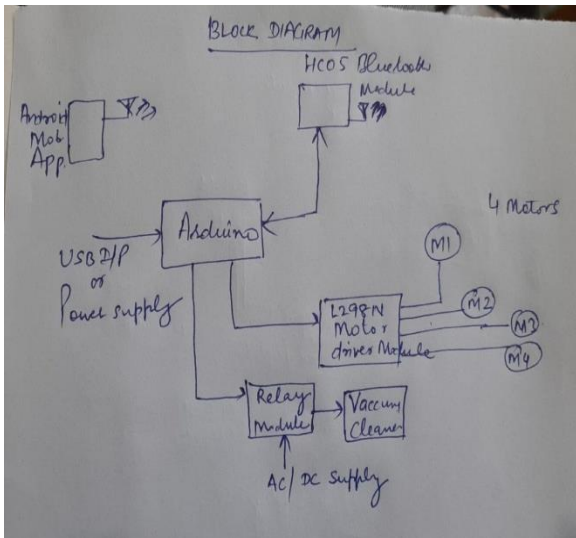
BLOCK DIAGRAM

CONCLUSION

The proposed system is efficient in terms of cost, time and management. Its user-friendly feature enables us to access it from any place through the mobile application. Compared to the existing systems, it has higher efficiency by overcoming the drawbacks as mentioned in the previous slides. Therefore, it is a well-proposed system that can be implemented in households and office environments The project aims on developing a vacuum cleaner that is very efficient for both dry and wet cleaning. The vacuum cleaner has a suction pump that collects the dust present on the surface. . It is both battery and solar panel equipped which acts as a source of electricity. The vacuum cleaner is controlled through an android application and can be accessed from any place. . The solar panel use sunlight to generate the direct current. The solar panel can operate with different voltage and current levels. There is no negative impact for the system as it collects the clean renewable energy in the form of sunlight then convert it into electricity. Automation is a great solution of this problem. So we make an autonomous floor cleaning robot.

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