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## Portable Autonomous Window Cleaning Robot

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**ABSTRACT:** The advancements made in technology of robotics have made life of mankind very much easier and comfortable. This paper describes a smart floor cleaning robot that allows cleaning the floor by giving instructions to the robot. This robot makes floor cleaning process easy and fast utilizing a wireless robotic cleaning system. This wireless system consists of a transmitter application that runs on an android mobile app which allows the robot to follow commands given by the user through the transmitter app. The proposed robot consists of Arduino UNO controller which has fourteen digital input/output pins, robotic arm with cleaning pad with a water sprayer for efficient cleaning. The Arduino UNO, on receiving the commands from android device through Bluetooth receiver, decodes the given commands and controls the motors to achieve the desired path and direction.

### I. INTRODUCTION

Robotics is part of Today's communication. In today's world ROBOTICS is fast growing and interesting field. It is simplest way for latest technology modification. Now a day's communication is part of advancement of technology, so we decided to work on robotics field, and design something which will make human life simpler in day today aspect. Thus we are supporting this cause. Robotics is the branch of technology that deals with the design, construction, operation, structural disposition, manufacture and application of robots and computer systems for their control, sensory feedback, and information processing. In this project mainly when ever robot senses any obstacle automatically diverts its position to left or right and follows the path. Robot consists of two motors, which control the side pair wheels of each and help in moving forward and backward direction. Robot senses the object with help of obstacle sensor. C.Nagarajan et al [9] studies IR pair is used for detecting the obstacle. The two basic parts for working with IR are the emitter and the detector. The emitter is typically an LED that emits near-infrared light. IR LED IR detectors are specially filtered for Infrared lighted are not good at detecting visible light. On the other hand, photocells are good at detecting yellow/green visible light, not well at IR light.

### II. POWER

The Arduino/Genuine Unoboard can be powered via the USB connection or with an external power supply. The power source is selected automatically. External (non-USB) power can come either from an AC-to-DC adapter (wall-wart) or battery. The adapter can be connected by plugging a 2.1mm center-positive plug into the board's power jack. Leads from a battery can be inserted in the GND and Vin pin headers of the POWER connector.

### III. EXISTING SYSTEM

A robot vacuum cleaner is an autonomous robotic vacuum cleaner which includes self-drive mode and cleans the floor autonomously without human control. This robot vacuum cleaner consists of spinning brushes, mopping, UV sterilization and security cameras for cleaning purpose. This vacuum cleaner had some drawbacks like colliding



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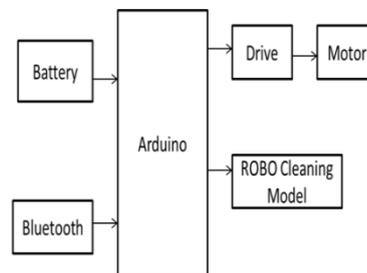
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with obstacles and stopped at a shorter distance from walls and other objects. It was not able to reach to all corners and edges of the room and left those areas unclean [3]. An automatic floor cleaner robot has brushes attached to its sides to collect the dust. This robot uses ultrasonic sensors to avoid obstacles and change its direction and it has a suction unit that sucks in the dust while moving around the room freely. But the drawback of this robot is that it cannot clean the wet floor.

## IV. PROPOSED SYSTEM

In proposed system robot is Design and Implementation of Smart Floor Cleaning Robot using Android App” for better understanding of the proposed work. This block diagram consists of 12v DC motor, L293D IC, Bluetooth module, cleaning mechanism and Arduino UNO. The power supply is given to the Arduino UNO as well as to relay. The relay works as switch so that it controls the water pump whenever the user receives the commands from transmitter app. The robotic arm used here consists of three dc motors where one dc motor is used for moving robotic arm up and down, second dc motor is used to close and open the teeth of robotic arm and last dc motor is used to rotate arm completely. Here we use L239D drivers for driving dc motors to move in forward and backward direction. Bluetooth module is used to control the robot using mobile phone application within a range.

## V.BLOCK DIAGRAM



## VI.BATTERY

The battery is an essential component of almost all aircraft electrical systems. Batteries are used to start engines and auxiliary power units, to provide emergency backup power for essential avionics equipment, to assure no-break power for navigation units and fly-by-wire computers, and to provide ground power capability for maintenance and preflight checkouts. Many of these functions are mission critical, so the performance and reliability of an aircraft battery is of considerable importance.

## VII.BLUETOOTH

HC-05 module is an easy to use Bluetooth SPP (Serial Port Protocol) module, designed for transparent wireless serial connection setup. Serial port Bluetooth module is fully qualified Bluetooth V2.0+EDR (Enhanced Data Rate)

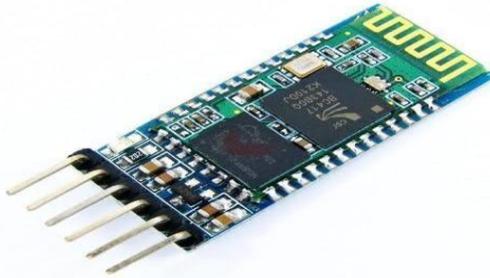


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3Mbps Modulation with complete 2.4GHz radio transceiver and baseband. It uses CSR Blue core 04-External single chip Bluetooth system with CMOS technology and with AFH(Adaptive Frequency Hopping Feature). It has the footprint as small as 12.7mmx27mm. Hope it will simplify your overall design/development cycle.

## IX.ARDUINO

"Uno" means one in Italian and was chosen to mark the release of Arduino Software (IDE) 1.0. The Uno board and version 1.0 of Arduino Software (IDE) were the reference versions of Arduino, now evolved to newer releases. The Uno board is the first in a series of USB Arduino boards, and the reference model for the Arduino platform; for an extensive list of current, past or outdated boards see the Arduino index of boards. You can find here your board warranty information.



## X.CONCLUSION

This research paper presents that floor cleaning process can be done in an easier manner and more efficiently by robot utilizing wireless robotic system. This proposed robot reduces the time and cost of labor. In the previous research papers like robot vacuum cleaner and automatic floor cleaner, robot had some drawbacks like colliding with objects in front of it and this vacuum cleaner couldn't reach to small areas and left those areas unclean and the automatic floor cleaner robot collects the dust but the drawback over here is that it does not clean the wet floor. These two drawbacks have been over come in this research paper.



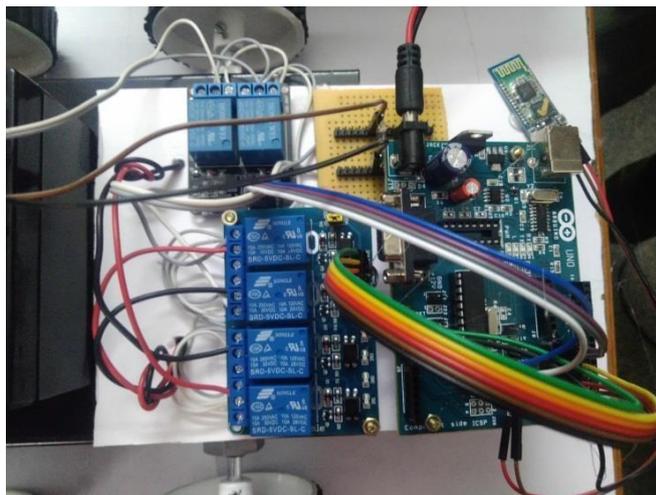
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## HARDWARE RESULT



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