

# Arduino Based Wireless Vacuum Cleaner with Load Carrier

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**Abstract:** Today's world is well known about the android. So many applications are running on it. Android Development platform open for everyone around the world that made by Google. This project is based on the Arduino PCB board. The project consists of Robot Car, which will operate by the Arduino board and it will control by mobile application. For this we will develop the programmed android application. The connectivity is provided by the wireless Bluetooth which is mounted on the Arduino module. This project uses Arduino board, in which ATmega328 microcontroller is installed. The programming of computer and electronic guided to a robot is usually an electro-mechanical machine. For manufacturing purpose many robots are built and that can be found in factories around the world. Designing of the latest invented ROBOT which can be control by using an application of android mobile. In our project we use Bluetooth communication to interface Arduino UNO and android smart phone. Arduino can be interfaced to the Bluetooth module. On the Android command the motion of robot can be control. As an additional feature we have mounted the vacuum cleaner in the front side by which it can also clean the dust and added a carrier which will act as load carrier. This robot can be reprogrammable and can be interchanged to provide multiple applications. Here we also used the concept of vacuum cleaner for cleaning purposed. It will we used in the half of the portion of the proposed module. The vacuum cleaner is very useful for cleaning.

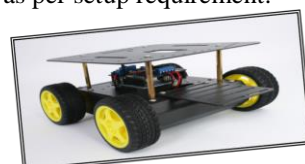
**Keywords:** Arduino Uno R3, Micro-Controller ATMEGA328p, Smart Phone, etc.

## 1. INTRODUCTION

Now a days, Android is very familiar for us. Millions of Devices are running on the Google Android OS. Google has made Android Development platform open to everyone around the world. This Project is based on the Mobile activity for these we develop an Arduino PCB layout for operating the Mobile activity of human interactions. These Project is mainly develop to operate any type hardware device with easy coding format not only this much but also for the future scope to random fields. In areas such as industry, manufacturing, production lines, or health used the robots as smart machine.

The robots do works 24hrs without rest and they perform hard ,dangerous and accurate works for making our life easy and increase the production that we gain from our works within less time.in many areas like industry, manufacturing, production lines or health etc. this works perform by assistive mobile robots that perform different work for improve our life. On a computing platform with computing ability, performance and connectivity than a feature phone built a smartphone. Smartphones are a more affordable and efficient hand held devices which can be used to support collaborative activities in a community. It is a result of a huge enhancement in mobile phones technology. New way find the human for interacting with machine. However, a major breakthrough was observed when gestures were used for this interaction.

We are proposed one module for automatic controlling of the robo vacuum cleaner and also it works as load Carrier. In our proposed module we are using the Android phone for user interface. we are provide one android application that is works on Bluetooth connectivity and for controlling that robo. Here we propose a module which is mounted by the Load Carrier and Vacuum Cleaner. We will use the Arduino UNO PCB board is mounted by the microcontroller. The microcontroller we will use that is ATMEGA328p. The microcontroller will act as a brain of the Arduino which will operate as the programme code is uploaded. Then after we will use the hardware device i.e. Motor Driver Shield which will provide power supply to the motor to rotate the wheels and it will take the input from the microcontroller. For the connectivity purpose we will use wireless bluetooth module which will provide the connectivity between the smartphone and Arduino board. The following fig. is the base proposed module; the dimension may vary as per setup requirement.



**Figure 1:** Proposed Base Module

## **2. LITURATUER SURVAY**

As we know the world grows very festally and also we know that there are rapid changes in technology means the technologies are developing day by day. The vast effects of technology that could be seen in education, management, industry etc. all these technology having their own existence. Also likewise to that the robotics technology is growing rapidly. As we see there are so many effects of technology in our life. The technology which is so different thought power and we also called the technology is made for the development means all the technology having their existence from that they are grown. Means, we called technology is made from the existence. Our proposed module is also based on same technology that is already in existence but we are adding some additional features in it. As we have seen in our daily life the robots that we are used for many purposes to maintain our house works. The Arduino based bots is having some disadvantages if we use it that does not fulfill our limitation or whatever we want from it. Consider a robo car if any obstacle comes in front of it then how they can aware about it? How it work in rain? How many network range it will give? There having such type of all problems that caused that technology failure. All that points take backward to this technology brings it in trouble. we know the home vacuum cleaner is also automated. We see the technology that we used today there having the vacuum cleaner like they work automatically, means if we used the vacuum cleaner they work on their particular time means for that we don't want any operator that will work automatically at on particular time. But we have no need to clean then also automated robo will work, due to this it will effects unwanted consuming time and energy also. If in your home doesn't having dust then also it will work to overcome such problem we proposed this module as our project.

## **3. PROPOSED MODULE**

As we see the effect of technology on our daily life. Means whatever the technology we are using that having some advantages and disadvantages. Or we can simply says coin have two side likewise we can says technology also having two side. A proposed module "Arduino based wireless Vacuum cleaner with load carrier" these topic suggested the concept of using arduino and with the help of android application. We are proposed one module like automatic machine or device or module. We are using here the Arduino kit, android application for controlling the robo, load carrier, vacuum cleaner. From this module we are going to construct or build that proposed module. The proposed module can look like given bellow the variation may be occur practically as per setup requirement.

There are some views as we see on the diagram. The UI view is based Android application for

handling it, we will require a operator. Second view is the Arduino that situated externally on the above diagram. Third view is that we are used here load carrier that we can see on the diagram. Fourth and last one is the vacuum cleaner we are using here vacuum cleaner for cleaning the dry dust with automated moving module. Fifth one is wheels of the robo that situated in the diagram. For handling our proposed we want one operator for giving command to the module. We are using here operator because of saving energy, saving electricity, time, and necessary dust which is we want to clean. These module works only if we give command to it. Our proposed module works fulfilling the limitation that cannot be satisfy by the other automated device.

## **4. HARDWARE REQUIRMENTS**

### **4.1 HARDWARE**

#### **4.1.1. ARDUINO**

Arduino is a single-board microcontroller to make using electronics in multidisciplinary projects more accessible. The hardware consists of a simple open source hardware board designed around an 8-bit Atmel AVR microcontroller, or a 32-bit Atmel ARM. The software consists of a standard programming language compiler and a boot loader that executes on the microcontroller. "Arduino is an open-source electronics prototyping platform based on flexible, easy-to use hardware and software. It's intended for artists, designers, hobbyists, and anyone interested in creating interactive objects or environments. An Arduino microcontroller is a simple yet sophisticated device, which has taken the world of electronics by storm. Because of its versatility in innovation, the product has gained several accolades from the electronics professionals.

#### **4.1.2. BLUETOOTH**

For global connectivity Bluetooth is global standard .Bluetooth is an essential component in this Project. For Exchange the data Bluetooth is connects to the microcontroller and the Android Smartphone. The module used here is HC-05 Bluetooth module. It is an easy to use Bluetooth SSP with typical -80dBm sensitivity, up to +4dBm RF power, low power 1.8V operation and several software properties that facilitates the connectivity. The range of Bluetooth is up to 10 meter. And it operates on 2.4GHZ frequency.

#### **4.1.3. MOTOR SHIELD**

A shield is convenient since you can just plug it in to your Arduino and wire the motors direct to it, but it lacks the flexibility of a raw driver chip which you can wire up precisely as your demand.

#### **4.1.4. JUMPER WIRE**

Jumper wires are used for making connection between items on your breadboard and your Arduino header pins. Use them to wire up all your circuits.

#### 4.1.5. DC MOTOR

Almost every mechanical movement that we see around us is accomplished by an electric motor. Electric machines are means of converting energy. Motors take electrical energy and produce mechanical energy. Electric motor is used to power hundreds of devices we use in everyday life. An example of small motor applications includes motors used in automobiles, robot, hand power tools and food blenders. Micro-machines are electric machines with parts the size of red blood cells and find many applications in medicine.

#### 4.1.6. VACUUM CLEANER

A vacuum cleaner is nothing but module from that we are clean the dust. With the help of vacuum cleaner. we can clean our room or house or any dusted place. Now we know that existing vacuum cleaner operate without operator.

### 5. SOFTWARE REQUARIMENT

#### 5.1 Software

##### 5.1.1. *ARDUINO UNO*

The Arduino Uno is a 8 bit microcontroller board based on the ATmega328. It has 14 digital pins and 6 analog pins and other power pins such as, GND, VCC, It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a 16 MHz ceramic resonator, a USB connection, a power jack, an ICSP header, and a reset button. It has SRAM 2kb and flash memory 32kb. EEPROM is with 1KB. Arduino is open source hardware board with many open source libraries to interface it on board microcontroller with many other external components like LED, motors, IR sensors and many other things one want to interface with Arduino board. Arduino is a complete board which includes all things to connect with external peripheral and to program through computer. It contains everything needed to support the microcontroller. We either need to connect it to a computer using a USB cable or power it with an AC-to-DC (7-12v) adapter. The Arduino circuit acts as an interface between the software part and the hardware part of the project INO UNO.

##### 5.1.2. *ANDROID STUDEO*

Android studio is the official integrated development environment for Google android operating system, built on Jet Brains' IntelliJ IDEA software and designed specifically for Android development.

##### 5.1.3. *WINDOWS OS*

Windows 10 enables developers to make device that combine the hardware –driving capability if Arduino with the software capabilities of windows. An example might be a security camera. Microsoft and arduino said windows 10 will be “the world’s first arduino certified operating system. “Arduino isn’t running windows10 directly, though; as of now arduino boards have gained the ability to access windows10 devices through windows remote arduino and windows virtual shield for arduino, the two open source libraries

### 6. ADVANTGES

- 1) Cleaning effortless: The cleaning of any dusted place it done very easily without wasting a much of time.
- 2) Energy consumption: when we are used it, means for handling it we don’t take much of a time and it will also save the energy.
- 3) Time: For cleaning the dusted area it take less time. And we don’t have to take for it much of the efforts because it is automated.
- 4) Gestures: Here we are used the palm gesture because it is better to give up and down a command
- Carry load: Our proposed module also carry the load of 1kg.
- 5) User friendly: Our proposed module will handle by anyone means anyone can operate it easily.

### 7. CONCLUTION

As per today’s vacuum cleaner robots model are considered, that our proposed module is very less time consuming it is very easy. As we see a newly develop technology that having more physical effort but over that our module reduced the physical effort of carrying load from one place to another. And also it will perform all the task with in the time, as in simple we called it as it will time reducing. Here we give in one device three module for implementation, for carrying load and for cleaning.

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