

Smart Floor Cleaner Robot using Android

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Abstract— This paper plan an smart floor cleaner Robot using Android. This project is used for school, collage and home, hospital purpose to clean the surface manually. When Robot turn ON, it first clean the surface using vacuume cleaner. The controller ATmega328p-pu used to drive two Gear motor and plastic gear motor also the pump motor and vacuume cleaner. This Robot is useful for reduce the human effort.

Keywords: Microcontroller (ATmega328pu), L293D (Motor Driver), Vacuume Cleaner, Android Application, Bluetooth Module, 12V Batter

I. INTRODUCTION

Smart Floor Cleaner Robot Using Android project designed to reduce the manwork and it consume the less time. The program build such way that the each and every area clean using Android application that control by human manually. In this project we use ATmega328p-pu microcontroller. The microcontroller is connect to Android application by Bluetooth module. When power is given to microcontroller first ON the vaccume cleaner and clean the whole surface that depend upon the user. Next the pump motor is ON and spray water on the clean surface then the motor driver IC(L293D) is used to control movement of the DC gear motor moving forward or backward and plastic gear motor is used for the cleaning mechanism. The movement of the Smart floor cleaner Robot is controlled by the android application keyboard that define by the programmer and it work manually.

II. LITERATURE SURVEY

The paper studied from literature survey are as follows:

A. iRobot

iRobot launched in 2002 first vaccume cleaner robot. Due to market demand a following type of robot are launched.

B. NEATO Robot

With NEATO robot operating time is 1.5 per hour and it also charging time is 3 hour. It providing the scheduling and that operated by the remote control.

PARAMETER	ROBOTS ROOMBA	SCOOBA	BRAAVA
Launch date	2002	2005	2006
Manufacture by	iRobot	iRobot	iRobot Sony
Type of use	Dry vaccume	Washing Floor	Floor mapping for hard surface
Technology	IR, RF and auto charging	IR with virtual wall acussmies	IR with virtual wall accussories for industrial cleaning
Price	500 doller	500 doller	700 doller

Fig. 1: Type of Robot

III. SYSTEM ARCHITECTURE

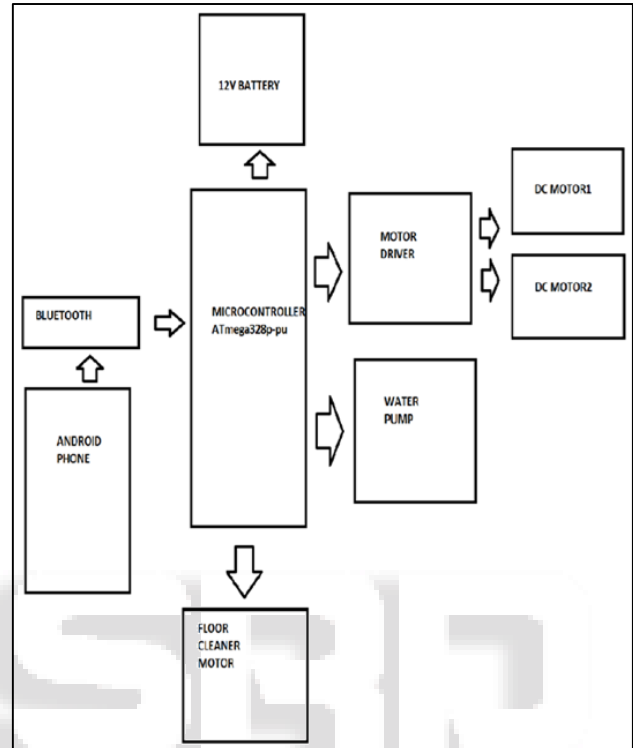


Fig. 2: block diagram

A. Hardware used:

1) ATmega 328p-pu/Arduino

The ATmega328p-pu microcontroller is High Performance and low power design 32KB programmable flash memory. ATmega328p-pu microcontroller has also 1KB of EEPROM and 2KB SRAM and it working Operating voltage: 1.8 - 5.5V that features is useful in the smart floor cleaner robot.

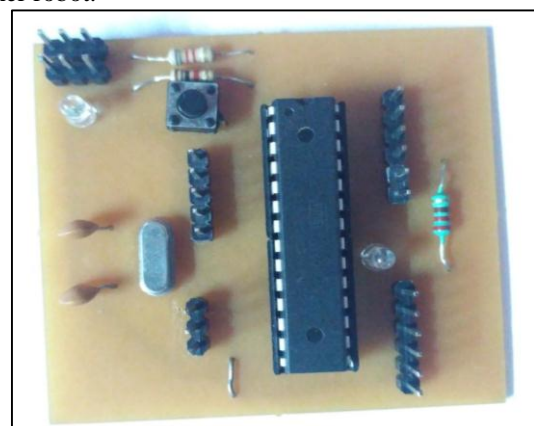


Figure3-Atmega328p-pu

2) Motor driver IC

L293D is motor driver integrated circuit. The motor driver ic has 16 pin IC. L293D IC is used in our project for the

operating two dc gear motor. In that IC has 16 pin and 2 input one motor and another 2 input pins for another motor. It has also work on the 5v and 12 v also. another 3 pins is connected to the ATmega328p-pu microcontroller. The motor driver ic is used for controlling the dc motor.

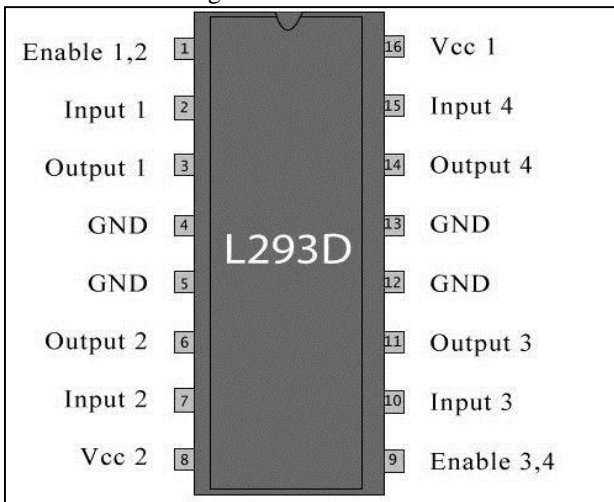


Fig. 4: L293D

3) Vacuum Cleaner

The vacuum cleaner to suck up dust and dirt from floors and from other surfaces and The dirt is collected by either a dustbag.

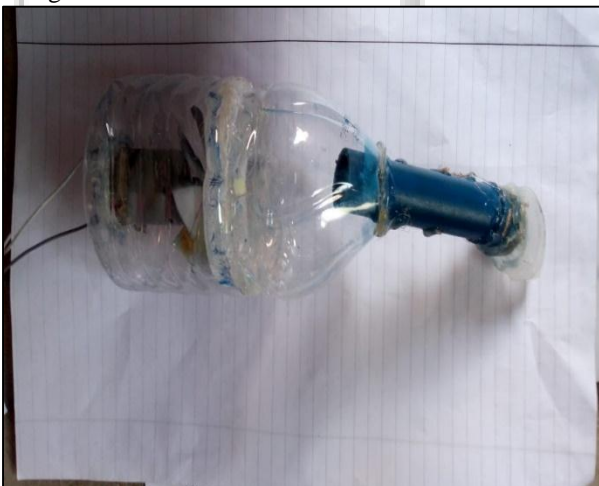


Fig. 5: Vacuum mechanism

4) Bluetooth Module

The Bluetooth controller HC05/06 is use in the our project smart floor cleaner robot that connected to the ATmega328p-pu microcontroller. The Bluetooth controller has 4 pins is used in this project and also it has required power supply: 3.6V to 6V DC.

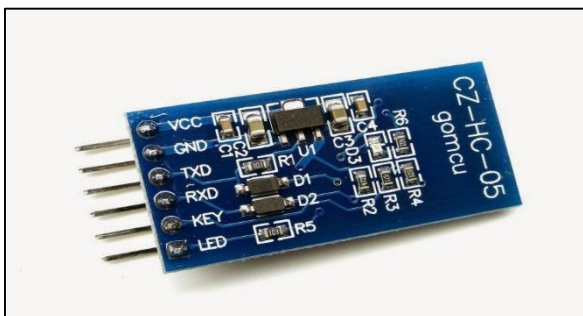


Fig. 6: bluetooth module

5) 12 battery

we use 12v lead acid battery for smart floor cleaner robot the nominal volatage is 12v,rated cap is 1.3AH,approx. weight 0.57kg,



Fig. 7: 12v lead acid battery

6) DC Gear motor

We use 100RPM DC Motor in the smart floor cleaning robot using android.Dc gear motor has been is high quality low cost.It operating supply: 4 to 12V.The two dc gear motor is used in our project that control by the motor driver ic(L293D).

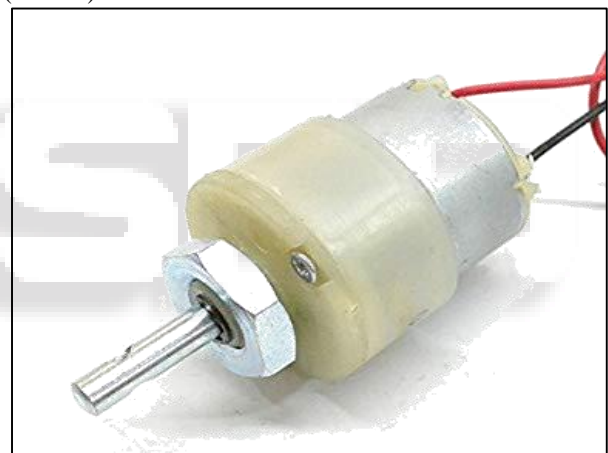


Fig. 8: DC gear motor

7) Plastic Gear Motor

Plastic gear motor is used in the smart floor cleaner robot,its operating voltage is 3V – 12V DC.In the our project smart floor cleaner robot using adroid use two plastic gear motor has speed approximately 100 RPMand also output torque : 4 Kg-cm.



Fig. 8: Plastic gear motor

B. Software used

1) Android Application

we use android application in our project smart floor cleaner robot, this application downloaded from the google play store and application name is Bluetooth Serial Controller. This application is directly connected to the Bluetooth controller HC05. Bluetooth serial controller is buttons set by manually and that operate by the human interface.

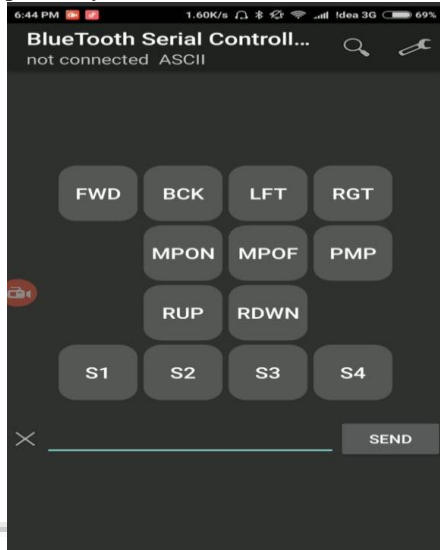


Fig. 9: bluetooth serial controller

2) Arduino IDE

The Arduino IDE is open source software that use for the Arduino programming of the ATmega328p-pu microcontroller that is use in the our project of smart floor cleaner robot using android that make easy to programming in arduino IDE. Arduino IDE programming is done in the sketch and save then build the program and upload in the Atmega328p-pu microcontroller. The programming flow chart is given into the figure12 that shows the how to flow of the program.

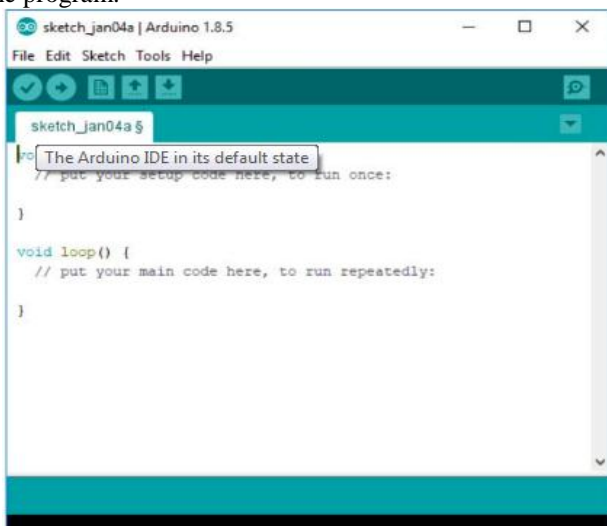


Fig. 10: Arduino IDE

3) Orcade / Easy EDA

In that project we have use orcad and Easy EDA software for the pcb designing. The smart floor cleaner robot using android the pcb layout design in easy eda. The easy eda software is freeware and easy to use. The PCB layout of the this project

are described in the figure11 shows the pcb layout of smart floor cleaner robot using android.

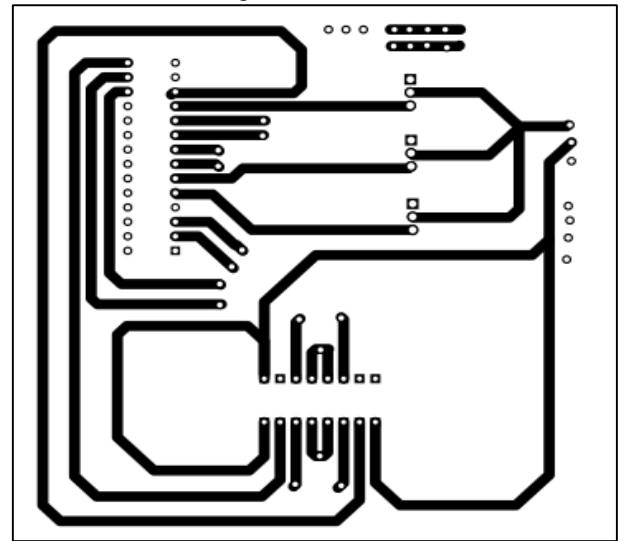


Fig. 11: PCB layout

4) Flow Chart

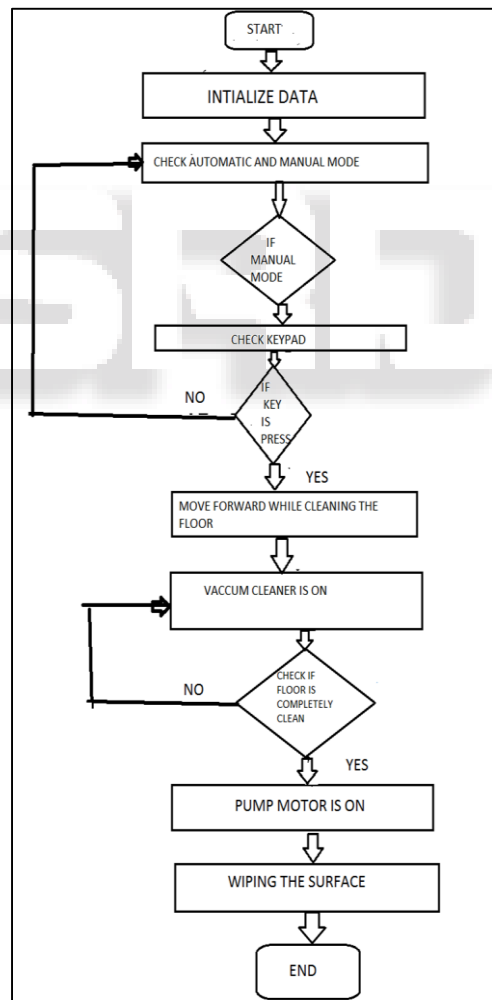


Fig. 12: Flow chart

IV. RESULT AND ANALYSIS

The aim of this project is to design and develop a smart floor cleaner robot and android application based vacuum cleaning robot.



Fig. 13: full development system

V. FUTURE SCOPE

Current situation 90 percent cost is goes for cleaning a floor is labor. That why we design smart floor cleaner robot using android that reduce human effort. In future this robot can be used automatically move and detect the obstacles by its own and hence changes the direction during moving on the surface. The cost is 5000INR our project in future we design for automatic mode using uv and ir sensor and more effective and accuracy.

VI. CONCLUSION

In this paper we are utilized the smart floor cleaner robot using android application. In ordinary floor cleaning machine only vaccum cleaner or surface cleaner are used but we have both implemented in this robot. this robot work on battery and it also small size. This robot work on the manual mode and also this project provide the efficient cleaning.

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