

AUTONOMOUS FLOOR CLEANING ROBOT

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Abstract - Cleaning the floor is an important task which takes a lot of time; sometimes we assign people for cleaning and pay them money. But due to the advancement of technology households are becoming smarter and more automated, which provides convenience for the people. There are various vacuum cleaners available in the market but they do not include wet cleaning and operate manually. So, the main purpose of our project is to design an autonomous floor-cleaning robot to make the cleaning task much easier and to include dry and wet cleaning in one design. This robot is designed to clean homes, schools, offices, it is created to make the job easier.

Keywords- smartphone, ATmega328, Bluetooth model HC05, servomotor, motor driver IC LM293D, DC motor.

1. INTRODUCTION

The main goal of this research paper is to create a robot that reduces a person's effort in scrubbing and sweeping while also finding a way to resolve the drawbacks of the previous cleaning method. Robots are using for different purposes in home automation. The traditional floor cleaning process is time-consuming. Due to which people are experiencing various health issues. Therefore vacuum cleaner is designed to reduce these problems. There are different types of vacuum cleaners available in the market. But they are expensive, bulky, and work on either wet or dry cleaning, so to provide a solution regarding these problems we designed the Autonomous Floor Cleaning Robot. This robot is cost-effective with the combined applications of wet and dry cleaning operations. It has two modes automatic and manual mode. Manual mode is operated by a mobile phone application so that the user can handle the robot. And for Automatic mode robot itself performs all the activities. For obstacle detection, an ultrasonic sensor is used in automatic mode. This robot is affordable to common people and could be used in houses, schools, hospitals, offices. Due to its small size, this robot can reach places where humans are unable to go

1.1. PROBLEM STATEMENT

In the traditional floor cleaning process, we use mops and brooms to clear the dirt and dust particles on the floor which requires a lot of human effort. Also, the normal floor cleaning process is time-consuming. In the past few years different types of vacuum cleaners are developed and

available in the market but they are used for dry cleaning purposes only. Whereas the cost of these vacuum cleaners is also very high, this is not affordable for common people. The additional features built on the existing systems are quite bulky and expensive. Due to manual handling, this system consumes more power. So, the motive of this research work is to provide easier solutions to all these operational issues, drawbacks in the existing system.

1.2. OBJECTIVES

1. To design & develop a machine that reduces human efforts & helps in easy and quick cleaning at an affordable cost.
2. To develop a user-friendly system so that anybody with very less basic knowledge can handle the machine.
3. To ensure safety while handling this machine.
4. To develop a fully self-contained low maintenance system.
5. To develop a low power consumption system.

2. BLOCK SCHEMATIC & WORKING

An autonomous floor cleaning robot is dependent on ATMEGA IC has been created. This floor cleaning robot is an electronic application that operates in two modes as per user requirement automatic mode and manual mode. Unlike other floor cleaning robots, this isn't only a vacuum cleaner robot as it performs dry and wet cleaning operations in a single system unit. A separable mop is utilizing for wet cleaning purposes. In the automatic mode, the robot plays out all the activities on its own, handling all commands itself. Where firstly the robot initiates to start the operation and moves in desired commands to perform further cleaning activity. For the critical surface area to stay away from obstacles purposely ultrasonic sensors have been utilized. Assuming any obstacle is distinguished; a robot will suddenly change the path automatically and doesn't quit the ongoing cleaning process. In the cleaning process, it follows a crisscross approach where the water supply is attached, which consequently splashes water for cleaning. Therefore there is no need to join wet fabric every time for cleaning. Motor driver circuits have been utilizing to drive the motors. In the manual mode, the robot is operating through an

android application using an advanced mobile phone, which includes all the necessary commands for the cleaning operation of the system.

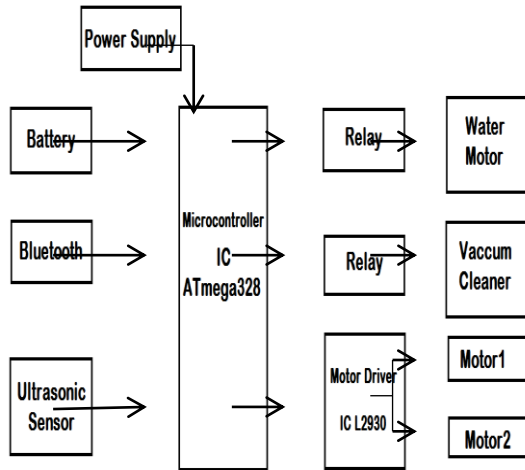


Fig1. Block Diagram

3. CIRCUIT DIAGRAM

The circuit diagram of proposed system is shown in fig.2,

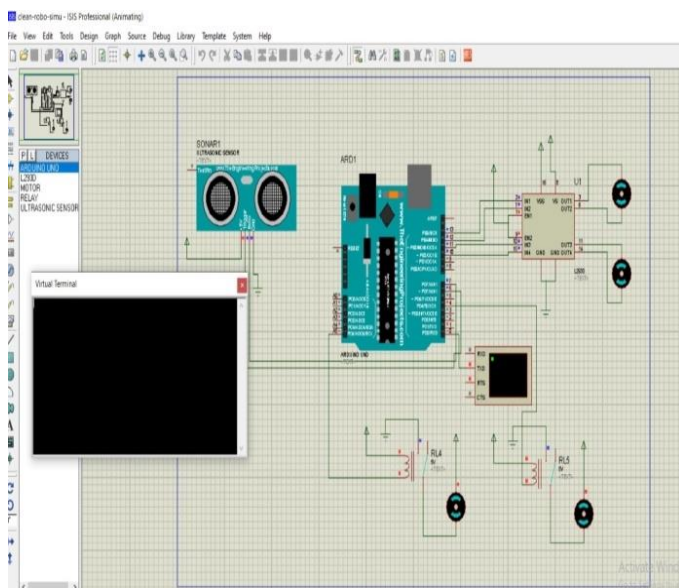
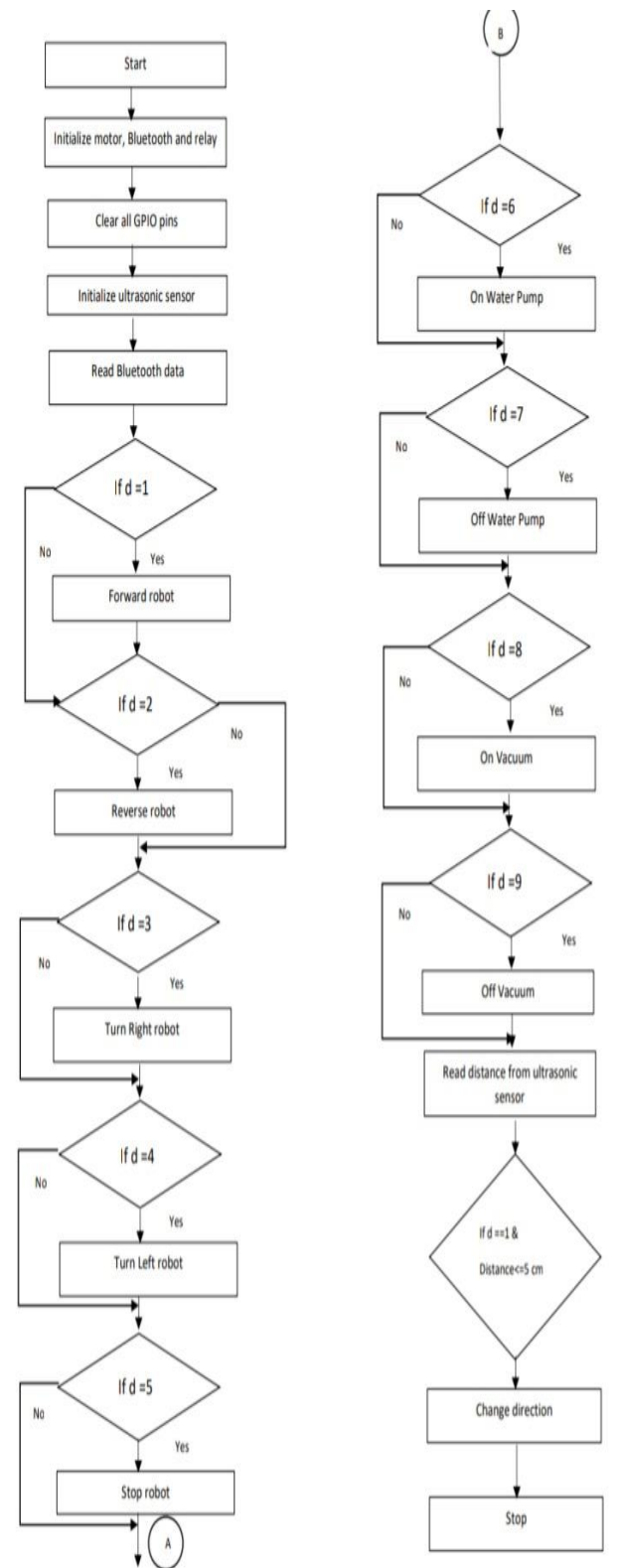


Fig2. Circuit Diagram

4. FLOW CHART



5. SPECIFICATION

components	Current Rating(mA)	Voltage Rating(v)	Power Rating(w)
1Atmega 328	12.3	5	0.0123
2 Relay	70	5	0.07
3 Relay	70	5	0.07
4 Bluetooth	30	5	0.03
5 CCP	130	5	0.13
6 Ultrasonic Sensor	15	5	0.015
7 water motor	220	9	0.22
8 Cleaner	350	12	0.35
9 DC Motor	600	12	0.6

6. RESULT



7. ADVANTAGES

1. Easy to operate.
2. No skilled person is required.
3. Less Maintenance cost.
4. Less noisy.
5. Clean more space in less time.
6. Less charging time.
7. Simple in construction.

8. Easy to handle.

8. APPLICATIONS

1. This can be used for Low range Mobile Surveillance Devices.
2. This can be used for Military Applications (no human intervention).
3. The robot can be used for Home automation.

9. CONCLUSION

This research paper explains sweeping and mopping operations for the floor very effectively. It lowers labor costs, saves time, and offers effective cleaning. The robot is controlled by an Android application and a Bluetooth module.

10. FUTURE SCOPE

We can replace Bluetooth module with GSM MODEM. Obstacle detection will be added to the same robot.

With some minor modifications, this same robot also can be used to clean the solar panels.

11. REFERENCES

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