



Automatic Floor Cleaning Robot

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ABSTRACT

Automatic floor cleaner is an automated machine that facilitates the user to keep their place clean and hygienic. Many industries are working in the automation field to make autonomous cleaners. This paper deals with the development of automatic floor cleaner. Now a day's major emphasis is given on the field of robotics for decreasing human efforts. Our aim is to construct a floor cleaner which will be fully automatic providing dry and wet cleaning as well as UV sterilization. The current market is occupied by cleaners with only one or two functionalities. For its cost reduction and simplicity, we are using Arduino. The cleaner will be a step for providing comfortable life by resolving problems in traditional floor cleaning methods.

Keywords: IOT, Robotics, UV Sterilization

1. Main text

Robots have turned out to be an important part of day-to-day life due their effectiveness in assisting humans in various applications. In this paper, we are considering one of those applications in the form of cleaning. Considering this, we are proposing an Arduino controlled model that performs the required operation of cleaning. The main aim of this project is to develop a low maintenance, cost effective, versatile prototype robot that can perform dry as well as wet cleaning. It can operate in autonomous mode and is designed with some additional features like UV sterilization, vacuum cleaner. All these features turn out to be handy in improving the life style of humankind

It simultaneously executes sweeping and scouring jobs, detects obstacles, and also includes an automated water spray. Features of Floor Cleaning Robot:

1. Robotic vacuums are quite simple to use.
2. Operation With No Hands.
3. Easy to maintain.
4. Establish a cleaning schedule.
5. It helps you save time and effort.
6. Wi-Fi accessibility.
7. Capable of handling small spaces

1.1 Problem Statement

An economical and efficient Automatic Floor Cleaning Robot is the most robust impure cleaning implementation. Cleaning now days has become challenging in our day-to-day busy life.

1.2 Primary Goal

Creating a Floor Cleaning Robot which is controlled by Bluetooth for cleaning floors by giving instructions form the mobile. By using Bluetooth we can direct and turn the system as per ones requirement.

2. Embedded Systems

An embedded system is a computer system designed to perform one or a few dedicated functions often with real-time computing constraints. It is embedded as part of a complete device often including hardware and mechanical parts. By contrast, a general-purpose computer, such as a personal computer (PC), is designed to be flexible and to meet a wide range of end-user needs. Embedded systems control many devices in common use today. Embedded systems are controlled by one or more main processing cores that are typically either microcontrollers or digital signal processors (DSP). The key characteristic, however, is being dedicated to handle a particular task, which may require very powerful processors. For example, air traffic control systems may usefully be viewed as embedded, even though they involve mainframe computers and dedicated regional and national networks between airports and radar sites. (Each radar probably includes one or more embedded systems of its own.)



Fig. 1 Embedded System

2.1 Tools

Programming as a whole only accounts for a minor portion of embedded development. In contrast to the Unix and PC worlds, where just a few significant embedded architectures exist, there are many more embedded architectures. This implies that the cost of the tools is higher. They are also less developed and have fewer features. You will almost always discover a compiler problem of some kind on a significant embedded project at some point.

Tools for debugging are another problem. A debugger can't always be run on your embedded processor because you can't always run general programmes on it. This makes it challenging to fix your programme. This problem can be partially solved by specialised hardware like JTAG ports. However, lasting equipment damage may result if you hit a breakpoint while your system is in charge of real-world hardware (such a motor). Because of this, programmers who specialise in embedded systems quickly master the use of serial IO channels and error message-style debugging.

3. Hardware Requirements

- 1.Regulated power supply with voltage regulator.
- 2.MEMS accelerometer sensor.
- 3.GPS module.
- 4.SR04 Ultrasonic sensor(obstacle detection)
- 5.IR flame sensor(fire detection)
- 6.LCD
- 7.Buzzer
- 8.Microcontroller.
- 9.RS232 based serial interfacing.
- 10.GSM Modem

4. Software Requirements

- 1.Arduino IDE for compiling and dumping code into Microcontroller
- 2.Express SCH for Circuit design.
- 3.Proteus for hardware simulation.

5. Arduino UNO



The Arduino Uno is a microcontroller board which has ATmega328 from the AVR family. There are 14 digital input/output pins, 6 Analog pins and 16MHz ceramic resonator. USB connection, power jack and also a reset button is used. Its software is supported by a number of libraries that makes the programming easier.

6. Advantages

- Battery operated floor cleaning machine.
- Requires little human intervention.
- Convenient product that can be used to clean the room without much physical effort.
- Saving person valuable time.
- Using Bluetooth Technology.
- Controlling robot through android smart phone.

7. Disadvantages

- Interfacing Bluetooth module to the microcontroller is very sensitive.

8. Conclusion

Integrating features of all the hardware components used have been developed in it. Presence of every module has been reasoned out and placed carefully, thus contributing to the best working of the unit. Secondly, using highly advanced IC's with the help of growing technology, the project has been successfully implemented. Thus, the project has been successfully designed and tested.

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