A Review Wireless Floor Cleaning Robot

M. J. Garud*, V. R. Shinde, V. S. Dudkekar, S. S. Thorat, K. M. Aldar

Department of Computer Science and Engineering, Sanjay Ghodawat Group of Institutions, Atigre, Kolhapur, Maharashtra, India

ABSTRACT

Nowadays human and machine interaction with each other is moving away from only pen and computer and is becoming much more pervasive and much more congruous with the physical world. As the days are passing, gap between the human and the machines have been reduced by their interactions because of artificial intelligence. Manual controlling work by human is taken over by the robot technology and many of connected appliances have been used extensively. So here we represent the technologies that intend the working of floor cleaning robot in any of two modes that is automatic and manual. All the software and hardware operations are controlled by 80S52 microcontroller. The robot can perform sweeping and mopping task. The robot is incorporated with IR Sensors for obstacle detection and automatic water spray pump. Four motor are used to for cleaning one for water pump and one for wheels.

Keywords: Human, Machine, Artificial Intelligence, Robot, Sensors

I. INTRODUCTION

Robot is the machine and used for various purposes in domestic and industrial applications. After the introduction of I-Robot, Robot appliances are entering in consuming market. Many related appliances are followed by various companies. Initially the main focus was on having a cleaning device. As the time passes many improvements were made and more efficient appliances were developed.

This cleaning robot is an electric home appliance, which works in two modes as per the customer's comfort "Manual and automatic". Unlike other floor cleaner robots this is not a vacuum cleaner robot; it performs sweeping and mopping operation. Detachable mop is used for mopping. It works on 12V supply. In the automatic mode, robot performs all operations itself. First robot starts it moves ahead and performs cleaning operation. IR sensors are used for obstacle detection and to avoid hurdle.

The floor cleaning robot consist of less power consuming electronic and the mechanical part and it can operate during blackout period and don't need any human interface. By using the proposed cleaning robot initial cost of robot reduced and the human time an effort will be save. Mop is attached for mopping. It works on 12V supply. In the automatic mode, robot performs all operations itself. First robot starts it moves forward and perform cleaning action. For obstacle detection IR sensor is used.

Here we had designed a cleaning machine is operated using Smartphone. A Smartphone is a mobile phone built on a mobile computing platform, which has more advanced connectivity and computing ability than what a feature phone has. The innovation in this project is obstacle avoidance and control using android app via Wi-Fi.

For user comfort automatic water spray is attached which automatically sprays water on floor, therefore no need to attach wet cloth again and again for

mopping. Motor driver circuit have been used to drive the motors.

II. BACKGROUND

This section takes a vast look at Android smart phones and its features, hardware components, and how Smartphone will help to develop a community in the environment it is used in.

2.1 Android Platform:

Android Platform is powerful mobile computer and they become more and more popular smart phones used worldwide. They become more and more popular for software developers because of its powerful capabilities and open architecture; also it is based on JAVA programming language. Because android uses JAVA programming language getting started with the Android API is easy; the API is open and allows easy access to the hardware components. Android device provides numerous communication interfaces like USB, WI-Fi, Bluetooth that can be used to connect to the robot. It is a great platform for robotic for robotics system control, because it is much cheaper than any other ARM-based processing unit. We have chosen android platform because it is the widest used platform in the world and runs the largest number of smart phones worldwide.

2.2 DC Motor:

A DC Motor is electrical machines that convert direct current energy into mechanical energy. These type motors normally carry loads that require distinct speed regulation. Start torque developed in series motors normally ranges between 300% and 375% of full load, but can be reach high as 800% of full load torque. These motors can easily be configured in 2 to 3 speed, as well as reverse modes. DCM Permanent Magnet DC Motors produce high running torque, and provide a relatively simple, high efficiency DC drive as compared to other wound field motors. One of the advantage of a DCM Permanent Magnet DC motor is high efficiency.

These motors are easily reversed by changing polarity.

2.3 PIC16F877A Controller:

Circuit board is a surface were electronic components interconnected are assembled. The several types of existing circuit boards may be divided into two broad categories: those intended for prototype or experimental circuits, and those intended for production and/or commercial sale. Circuit boards used for work are often referred to as breadboards, or proto boards. Breadboards allow engineers to construct circuits quickly, so that they can be studied and modified until an optimal design is discovered. In typical breadboard, adhoc manner is use to design a circuit and components and wires are attached on that circuit, with new data and new understanding dictating the course of the design. Since breadboard circuits exist only in the laboratory, no special consideration need be given to creating reliable or simple-to-manufacture circuits—the designer can focus exclusively on the circuit's behaviour.

2.4 Display 16*2:

LCD (Liquid Crystal Display) screen is an electronic display module and used in large range of applications. A 16x2 display is basic module and is commonly found in various devices and circuits. These modules are preferred over seven segments and other multi segment LEDs. The 16 x 2 enlightened alphanumeric dot matrix displays is capable of displaying 224 different characters and symbols. A full list of the characters and symbols is printed on pages 7/8 (note these symbols can vary between brand of LCD used). This booklet provides all the technical specifications for connecting the unit, which requires a single power supply (+5V).

2.5 Ultrasonic Sensor:

Ultrasonic transducers are divided into three broad categories: transmitters, receivers and transceivers. Transmitters convert electrical signals into

ultrasound, receivers convert ultrasound into electrical signals, and transceivers can both transmit and receive ultrasound. In a similar way to radar and sonar, ultrasonic transducers are used in systems which evaluate targets by interpreting the reflected signals. For example, by measuring the time between sending a signal and receiving an echo the distance of an object can be calculated. Passive ultrasonic sensors are basically microphones that detect ultrasonic noise that is present under certain conditions Ultrasonic probes and ultrasonic baths apply ultrasonic energy to agitate particles in a wide range of materials.

III. PROPOSED SYSTEM:

A robotic cleaner is an autonomous electronic device that is intelligently programmed to clean a specific area through a vacuum cleaning assembly. Some of the available products can brush around sharp edges and corners while others include a number of additional features such as wet mopping.

- ✓ Robot can be operated automatically and manually as per the user convenience.
- ✓ Robot can be operated using Android app.
- ✓ Will provide the security feature by user.
- ✓ It will spray the water from small tank fitted on panel.
- ✓ Motor will start rotating and mob attached will clean the floor.
- ✓ Sensors are attached to detect the physical barrier.
- ✓ Dryer motor is also attached to dry the wet floor.
- ✓ User Registration.

IV. DESIGN
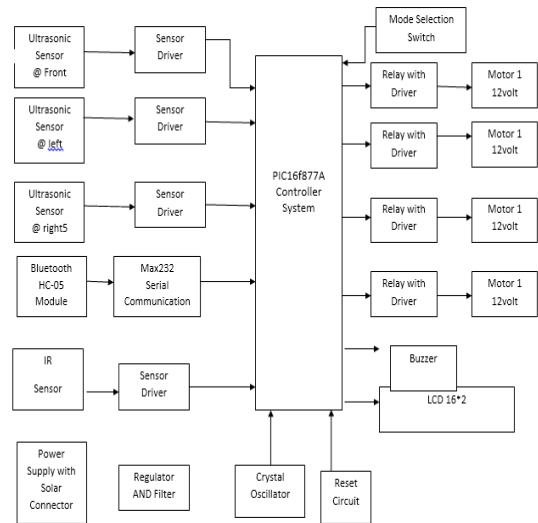
Block Diagram

Figure 1. Block Diagram

A smart phone android operated robot. Now here is a simple to control your robot using Wi-Fi module with your Smartphone device. The controlling device of the whole system is PIC16F877A Controller Board, Wi-Fi module and dc motor is interacted to the device. The data received by the Wi-Fi module from android Smartphone is fed as input to the controller. The controller acts according to the dc motor of the robot. The robot can be moved in all the four direction. In achieving the task the controller is loaded with program written using Embedded 'C' language.
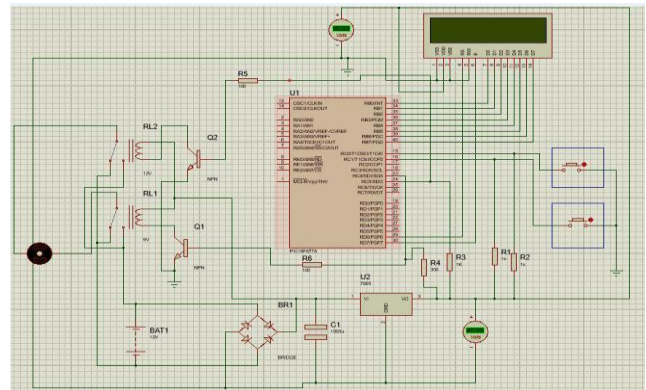
Circuit Diagram

Figure 2. Circuit Diagram

The circuit diagram is a graphical representation of an electrical circuit. A pictorial circuit diagram uses simple images of components, while schematic diagram shows the components, and interconnections of the circuit using standardized symbolic representations.
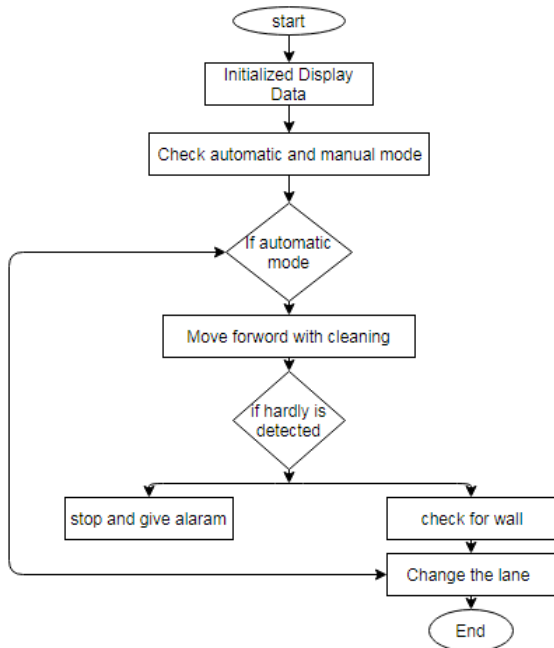
V. FLOWCHART

Automatic mode:

Figure 3

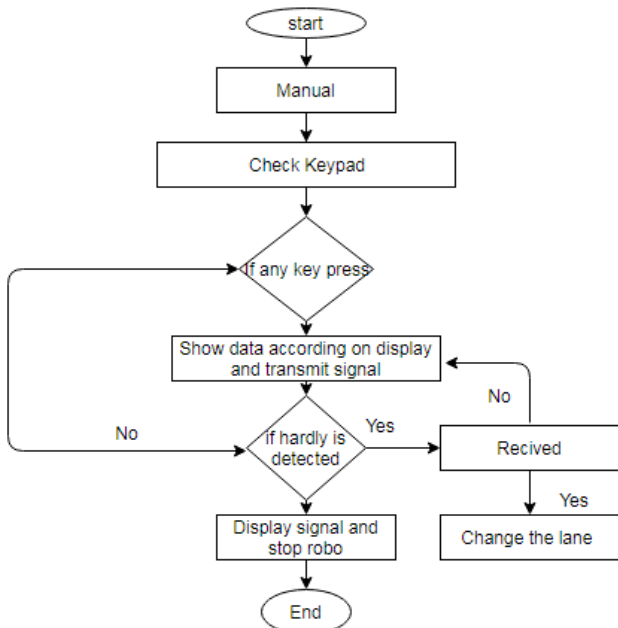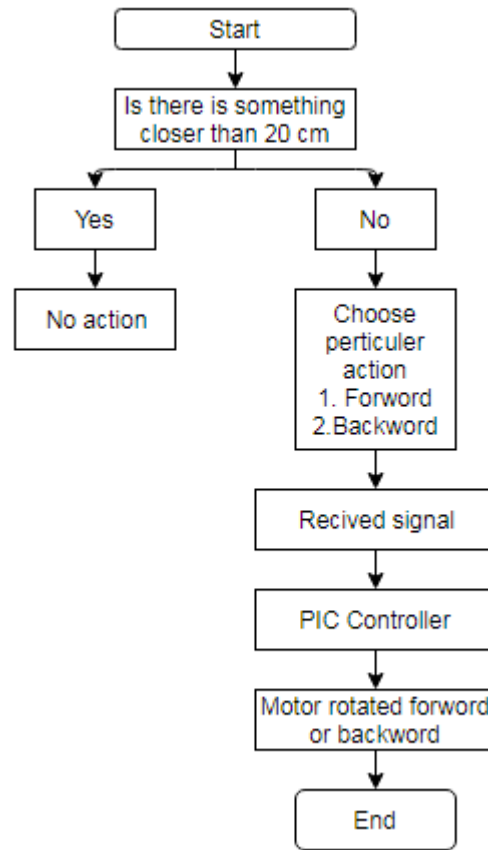**Manual mode:**

Figure 4

IR Sensor:

Figure 5

VI. CONCLUSION

We have surveyed different components that are going to use in the project and have studied about the components. Completion of this project will bring a new product to the world to increase speed and efficiency. While developing this project, new and innovative solutions were required. Overall, the learning objective of this project provided an opportunity to research beyond the academic requirements.

VII. REFERENCES

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