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FLOOR CLEANER USING ARDUINO AND BLUETOOTH

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Abstract: Automation is a great solution of this problem. So we make an autonomous floor cleaning robot that operated by internet of things and Arduino Nano programming. Ultrasonic sensor is the most important component for autonomous floor cleaning robot because ultrasonic sensor works as eyes of robot. Ultrasonic sensor useful for turning of robot by sense the obstacle or wall. Sensing distance range of robot set by Arduino Nano programming. In this range robot sense the obstacle and turn back.

Households of today are becoming smarter and also more automated. Home automation delivers convenience and creates more time for people. Domestic robots are entering the homes and peoples daily lives, but it is yet a relatively new and immature market. However, a growth is predicted and adoption of domestic robots is evolving. Several robotic vacuum cleaners are available on market but only few ones implement wet cleaning of floors.

Purpose of this project is design and implement a Vacuum Robot Autonomous and Manual via Phone Application named as blynk. Vacuum Cleaner Robot is designed to make cleaning process become easier rather than by using manual vacuum. The main objective of this project is to design and implement a vacuum robot prototype by using Arduino Nano, motor driver Ultrasonic Sensor and to achieve the goal of this project. Vacuum Robot will have several criteria that are user-friendly.

INTRODUCTION

The smart floor cleaning robot using Arduino is designed using embedded technology. The wireless communication is implemented using Bluetooth to communicate with the robot via android application [1]. The electronic circuitry of the robot consists of the HC-05 Bluetooth module which sends the command to the microcontroller Arduino – UNO on which the software program is directly loaded.

CFloor cleaning robot has two switch that are connected with two batteries. First step is to on both switches. and connected HC-05 Bluetooth and make whole circuit online with bluetooth controller app. When we give signal from Bluetooth control app to start motion than a Forward motion will start by the program set by the Arduino Nano. we can control all the switch from Bluetooth control app as per the requirement of the cleaning. When switch 1 turn ON from the Bluetooth control app then the wheel start to move to forward. As we have set the data keys for each operation like forward, reverse, left, right, off, on and stop. Cleaning robots are used in domestic and industrial environment. The proposed model is divided into four sections namely: Robotic Car, Bluetooth Module and Moppers. The robotic car moves in four desired directions as per the command given by the user. This application is used in smartphone to transmit the commands by Bluetooth connectivity with the Robot. The floor cleaner available in the market requires a lot of human efforts and assistance. Manually cleaning may not wipe off the dust properly as some dust particles may remain on the floor and it can affect the human health adversely. This problem gives a fantastic idea to engineers and researchers to design a robot that can be a helping hand in this work.

I. Literature Survey

[1] The initial survey is based on the person's thermal imaging, which can detect the person's elevated temperature and prevent them from entering the institution or offices. They paired an AI-enabled IR camera sensor with an Arduino uno to make this procedure completely automated without the need for human participation.

[2] The system is separated into three elements in the second survey: hardware, firmware, and software. The most often used forehead temperature sensor, the MLX90614, is used as the basis for measurement in this system. It can detect temperatures ranging from -40 to +125 degrees Fahrenheit.

[3] The third survey focuses on the accurate monitoring of a person's oxygen levels. blood, collecting and transmitting data via wireless communication to a personal cloud storage via IoT.

Literature Summery

In the initial survey, the procedure is based on cleaning floor, A host Bluetooth device is capable of communicating with up to seven Bluetooth modules at same time through one link. Considering it's normal working area of within eight meters, it is especially useful in home environment. Thank for Bluetooth technology and other similar techniques, with dramatic increase in smartphone users, smart phones have gradually turned into an all-purpose portable device and provided people for daily use

In operates on dual modes i.e. automatic and manual. In automatic mode, decision is made on the basis of outputs of sensors being processed by Arduino and control actuators by H-Bridge driving circuitry. In manual mode, robot cleans the particular area of room by using laptop with GUI inVisual Studio via. Bluetooth Connectivity

Vito M guardi developed an android application for a robot driven by a microcontroller. His idea of The idea of his work is to show that android app can be operated using totally different electronic devices. He also invented a communication protocol for android smartphone and robot using Bluetooth.

Nowadays smart phones are becoming more powerful with rainforested processor larger storage capacities, richer entertainment function and more communication method. Bluetooth is mainly used for data exchange;add new features to samet phone. Bluetooth technology, created by telecom vendor Ericsson in 1994, shows it's advantage by integrating with smart phones. It has changed hoe people use digital device at home or office, and has transferred traditional wired digital device into wireless devices.

A host Bluetooth device is capable of communicating with up to seven Bluetooth modules at same time through one link. Considering it's normal working area of within eight meters, it is especially useful in home environment. Thank for Bluetooth technology and other similar techniques, with dramatic increase in smartphone users, smart phones have gradually turned into an all-purpose portable device and provided people for daily use.

I. Methodology

1.To clean floor, leaner is an electronic device that is intelligently programed to clean a specific area using

Arduino based technology.The operating device or the controller we are using is a android supported smart phone.

2.We are controlling the robotic movement and controlling activity we are using one Bluetooth module . The application program send the commands in form of ASCII characters which are received by HC-05 Bluetooth module and passed to microcontroller through UART port of microcontroller.

3.The microcontroller is programmed to take desired actions according to the command (ASCII character) received to turn the motor ON or OFF. The microcontroller sends logic 1 or 0 at the specified pin to control

4..Motors used for the movement of the robot are dc motors which rotates at 360 degrees. One motor driver is used to drive themotors. Due to the insufficient current is provided by microcontroller to the motor, we need motor driver IC to boost the current taken from the microcontroller.

II. Flow Chart

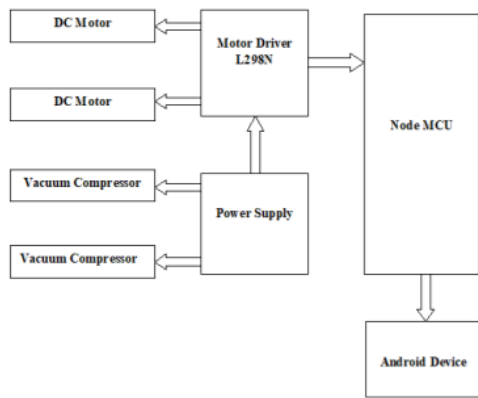


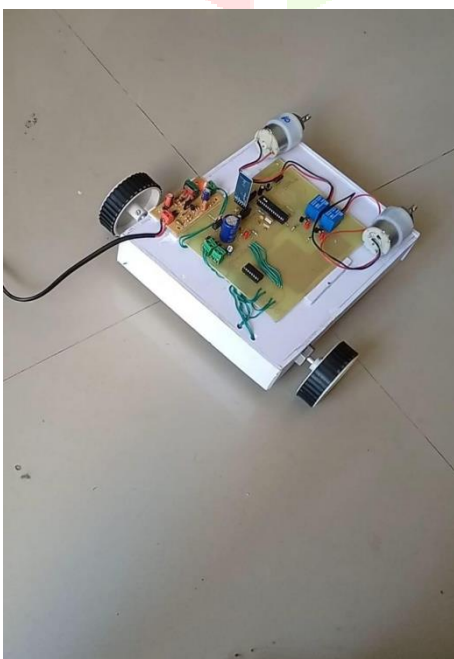
Fig.1: Block Diagram

III. Proposed Method

Cleaning is Important work approximate every place. Sometimes this is easy and sometimes difficult. Sometimes we assigned people for purpose of cleaning and pay money and sometimes cleaning is required in areas where presence of living being dangerous so we cannot assigned living being in every place. Some places are so that have a large floor areas in that place for cleaning purpose we need more than one person so we required some technique to compensate these problems. In advancement of science a robot come in light but it operate by a personnel. To avoid this limitation of personnel we require more technologies.

IV. Hardware Design

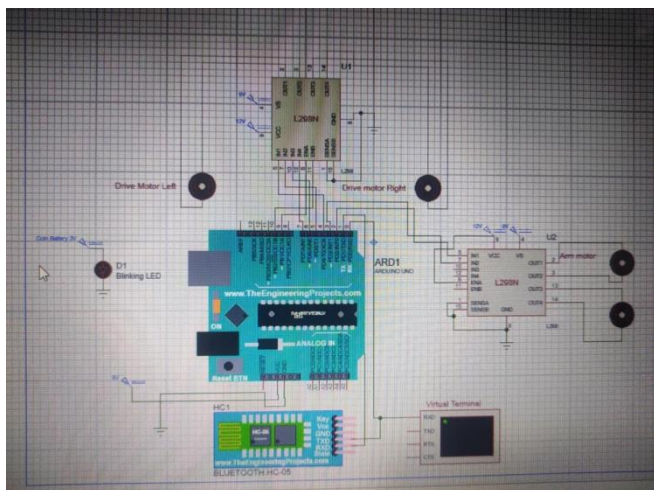
1. Mainly Floor cleaning robot using aurdino has
- 1.Moping Motor-2
- 2.Microcontroller-1
- 3.Aurdino nano-1
- 4.Motor driver L298d
- 5.Atmega 328 IC
- 6.HC-05 (Bluetoothmodule)



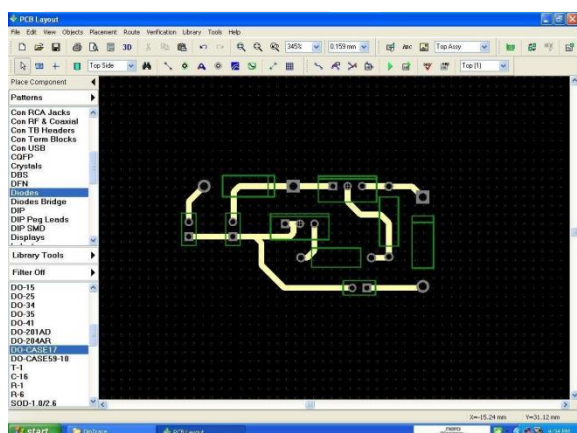
V. Software Design

Arduino IDE

The Arduino development environment is connected to the Arduino board by connecting it to a computer through USB (IDE). In the IDE, the user creates the Arduino code, which is then uploaded to the microcontroller where it is executed and interacts with inputs and outputs. Proteus is a Virtual System Modelling and circuit simulation application. The suite combines mixed mode SPICE circuit simulation, animated components and microprocessor models to facilitate co-simulation of complete microcontroller based designs. Proteus also has the ability to simulate the interaction between software running on a microcontroller and any analog or digital electronics connected to it. It simulates Input / Output ports, interrupts, timers, USARTs and all other peripherals present on each supported processor.



VI. Circuit Diagram



VII. Result and Discussion

Purpose of this project is design and implement a Vacuum Robot Autonomous and Manual via Phone Application named as blynk. Vacuum Cleaner Robot is designed to make cleaning process become easier rather than by using manual vacuum. The output is displayed to the user after the system has checked the condition.

VIII. Conclusion

We have successfully completed the autonomous floor cleaning robot model prototype and this project presents the implementation of an Automatic cleaning System controlled by Bluetooth and Arduino, but the speed of the vehicle can be reduced automatically due to the sensing of the obstacles.

It reduces the accident levels and tends to save the lives of so many people. By doing this project practically we gained the knowledge about working of automatic braking system and with this future study and research.

IX. Referances

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