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MEDIOT- A MEDICARE ROBOT

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ABSTRACT

This project is intended to creatively present a robot which will do the delivery of medicines, instructions to the patients in hospitals after getting instructions by the user/doctors whenever needed. The benefit of employing these techniques is used to maintain minimum human involvement and still maintain the required needs. We innovated an effective and reliable system to automate the manual monitoring of the patients in hospitals by enforcing the concepts of the Internet of Things. The purpose of this robot is to supply medical goods from a safe distance without getting in contact. Here, for this we have made a setup of sensor i.e., an ultrasonic sensor, speaker, camera, motors along with the Arduino UNO, Node MCU and motor driver. These electronic devices will be provided with a power supply source of 5V/12V accordingly. Also, a working Wi-Fi connection of internet will enable the device for real time communication. Considering the aspect of internet of things used over here, the system requires a good internet connection for the smooth and flexible monitoring using the device.

Keywords: Internet of things, Arduino UNO, node MCU.

INTRODUCTION

In this project we have used several modules for making it fully functional and these modules are Arduino UNO, Node MCU, Motor driver, camera. The purpose of using Node MCU is to make the wi-fi connection throughout the session for connecting patients with the doctors, we have used a camera with has a microphone and a speaker built in it and it works when it is connected to a network. This camera has a feature of showing the video in dark also with the help of Infrared rays and the live streaming of this could be seen in the mobile or computer. For creating an interface between Arduino and the Wi-Fi module we have used Node MCU. The entire project gets its power supply by various power units the motor driver is powered by 9 batteries in a combination of series and parallel where each battery accounts for 3.3V. Arduino is sustained by 2 batteries whereas the camera operates using a power bank.

Mediot is a social distancing awareness project related to the medical field. It carries a tray which can hold a certain number of medicines, it also have a camera that allows the controller to have a real time feed and it have a speaker attached that allows the controller for his/her way of communication, the controller send in a signal that is received via the Wi-Fi module interfaced with the Arduino that commands the motor driver for the proper motion of the bot, the crash landing is prevented by the use of ultrasonic sensor embedded in the front side also a microphone is available for entertaining two way communication between the controller and the patient.

OBJECTIVES

We have attained the following objectives-

- A robot to act as a mediator for any hazardous functionality.
- To ease the access of medication for those who are suffering from an easy to spread diseases (like covid-19).
- To interact with seriously ill patients while not being close to them, hence understanding their circumstances.

METHODOLOGY

The methodology of the Mediot is based on IoT i.e., Internet of Things. So, talking about IoT, IoT could be described as the collection of physical objects (such as sensors, microcontrollers), software which have some specified processing ability and other technologies that connect and exchanges data with other devices and systems over the Internet or other communications networks. The devices used in IoT need not to be connected to the public internet network, they only just need a network where they could be individually addressable.

There are several applications which uses IoT in our day today lives such as in the smart city, smart wearables, smart home, IoT retail shop and many more.

FEATURES OF THIS ROBOT

- Wi-Fi based user friendly interface
- Usage of Android Smartphones, Wi-Fi
- Low Power Consumption
- Economical
- Handy and easily controllable with the help of an app

This Project Focused on the following improvement:

- Wi-Fi Technology
- Source of power supply
- Cost reduction
- PCB designing

The major buildings block of this project is:

- Arduino UNO
- Node MCU ESP8266
- Power Bank
- DC motors with driver
- Webcam with speaker and mic
- Battery charging module
- Ultrasonic sensor

HARDWARE REQUIREMENT

A. ARDUINO UNO



Fig.1

Arduino uno is a microcontroller that can process various operations and provide us a mechanical output. It generally encodes the instructions provided to it and uses switching to perform those operations.

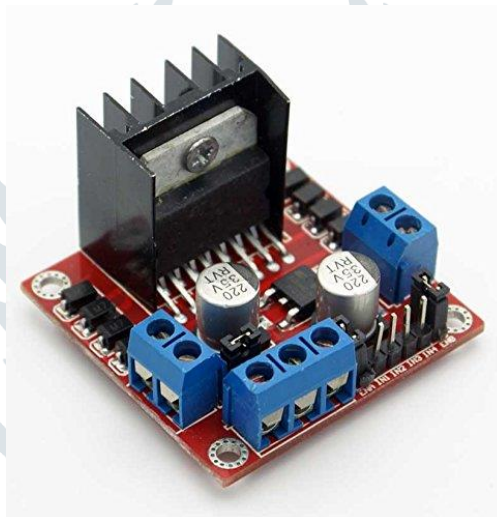
Arduino IDE is the environment that we use to program the set of instructions that our machine must follow.

For example, a machine that must perform a certain way under given conditions can use an if else statement to complete the logic. It needs void setup to initialize the pin modes which then behaves as inputs and outputs.

B. NODE MCU**Fig. 2**

Node MCU is an IoT module based on ESP8266 Wi-Fi module. Node MCU uses Lua Scripting language and is an open-source Internet of Things (IoT) platform.

The Internet of Things has been a trending field in the world of technology. It has changed the way we work. Physical objects and the digital world are connected now more than ever. As the operating voltage range of ESP8266 is 3V to 3.6V, the board comes with a LDO voltage regulator to keep the voltage steady at 3.3V. It can reliably supply up to 600mA, which should be more than enough when ESP8266 pulls as much as 80mA during RF transmissions. The device is very similar to Arduino but with some differences.

C. MOTOR DRIVER**Fig.3**

As the name suggests a motor driver IC imparts rotational motion to our motor. It generally is used for autonomous robots which work on a general logic.

We can use a DPDT switch for a manual robot as the rotation speed depends upon the user along with the direction of rotation but in an autonomous bot like line follower or our project Mediot, it needs a specific condition to move a certain way. So, the lack of that reasoning that we could have provided is filled by motor driver IC.

L293D is an excellent example for small bots. MD10C is also an example for relatively higher ranged motors. Some new versions are also in the market which have the capability to rotate two motors at once.

D. MOTOR

Motors as shown in figure 4, are used to rotate the wheels; these motors get the power supply from motor driver. These motors work according to the voltage supplied by motor driver L298N.



Fig.4

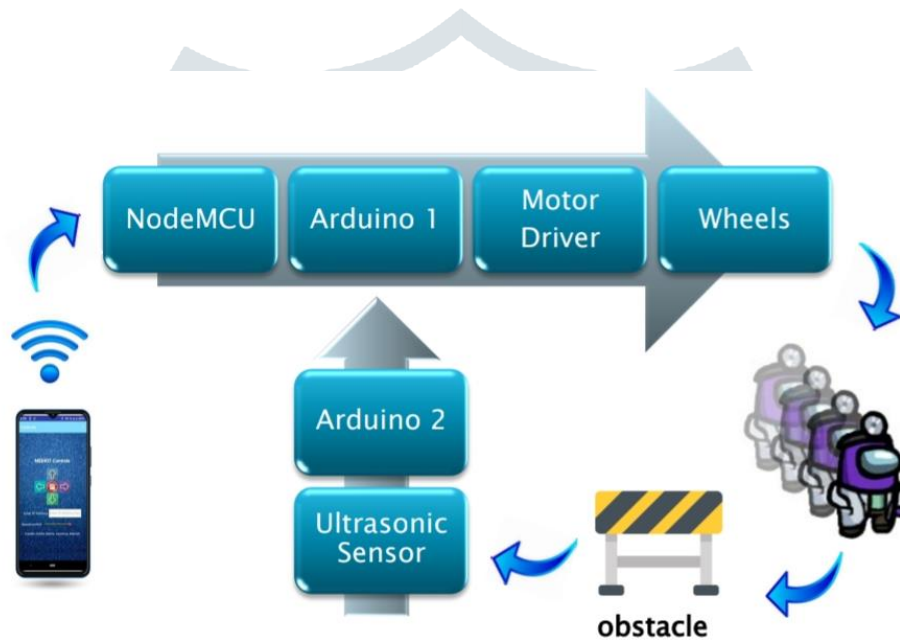
FLOW DIAGRAM

Fig.5 Flow diagram of Mediot

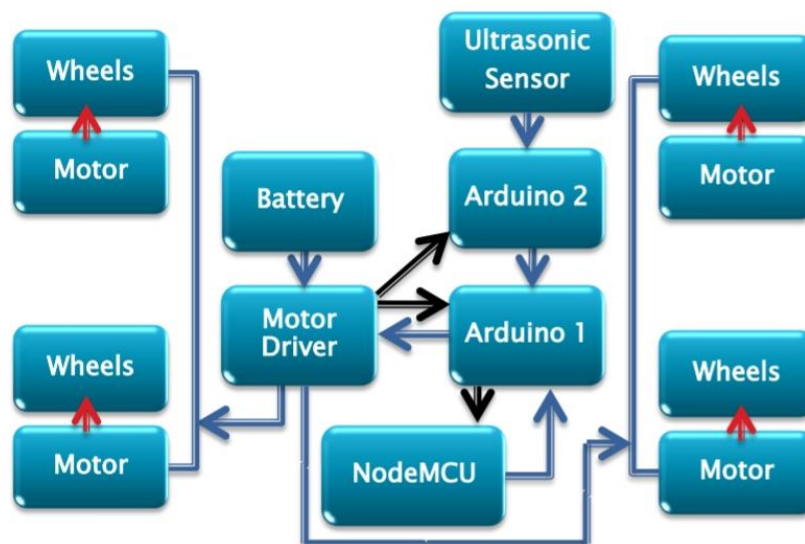
BLOCK DIAGRAM

Fig.6 Block diagram of Mediot

FUTURE SCOPE

- Multiple sensors can be added to enhance the performance of robot.
- Size and shape can be modified as per our requirement.
- Can use GPRS to get to locations that need emergency help.

CONCLUSION

Earlier no contacts were done by using physical cover and human presence was always involved if escalated the risk for both patient and the doctor, until and unless a physical checkup is required (in some cases also a physical check) Mediot can successfully act as a mediator and keep a check on the patient on a regular basis. This is achieved and if we take in account the future scope Mediot can bring revolutionary change.

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