

Tech Me Show Me- End User Personalization Of A Smart Home Companion Robot

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Abstract- *Now-a-days robots are playing a very important role in the industry level and also out of the industry. Dependency on robots is increasing for their fast and reliable working speed and accuracy. Considering that demand of the robot increasing every day. This research was conducted focusing on the necessity of robots in our daily life. This paper proposes a system where a robot can be controlled in ways like google voice, automatic mode. The prototype was built and tested. The robot prototype will be able to receive voice command from short distance. In case of long distance communication user will be able to connect through internet using IoT. This project presents the event of a sensible voice control robot using Google's assistant. The concept behind this can be to manage controlling the robot devices with voice. On the market, there are several devices accessible to try and do that. However, creating your own is awe-inspiring. Build your personal assistant which will do the work for you. Simply your assistant needs voice commands. during this project single board pc i.e. Nodemcu ESP8266 is employed which has making Blynk application account then linking to the IFTTT web site then adding to Google Assistant for voice commands. During this robot appliance like spy robot, surveillance and military robot are used which might be management simply victimization Google help from the voice control. Here we'll install Google help within the Nodemcu ESP8266 and mobile are going to be hooked up with a microphone that takes all the voice commands through that it'll mechanically management the robots. Because the user provides the voice command to the microphone per that the robot will be control and monitoring consequently*

Keywords- Nodemcu ESP8266, Android Application, Robotics

I. INTRODUCTION

Traditionally, surveillance systems of voice control say that, the first term to be considered is Voice Identification i.e. prepare the system to accept human voice. Voice Identification is a technology where the system accepts the words (not its Content) given through Voice. Voice is a Perfect approach for robotic control. The robot operation is

controlled by human voice-commands, can provide a potential solution to their problems.

The purpose of this project is to make a mobile robot which will be able to receive the voice commands. The Voice command can be performed at real time. Moreover, the robot has Motion detection where it does not crash against object or Hollow pit. The Intelligent robot is controlled anywhere by using Android application or web page through WiFi. ESP8266 is the major part of the proposed system. It consists of inbuilt Wi-Fi and Bluetooth in the same processor. The ESP8266 model-B is high speed achievement processor compared to the other controller. Android application is easy to handle and established by MQTT protocol.

The idea behind this can be to control the robot with voice. On the market, there is a unit several devices out there to try and do that. However, creating your own is awful. Build your personal assistant that may do the work for you. Simply your assistant needs voice commands. Consistent with voice command using robot will be control and monitoring.

The main contributions of the work in this thesis can be summarized as follows First chapter described introduction iot robot and need of analysis of iot smart iot process, problem statement of iot robots . Chapter 2 describes the existing methods used for the automation work. various sources, inferences from literature and the methods used for smart home automation are presented. Chapter 3 analyses the performance of the proposed system design techniques. A brief study of the various sensors, software presented in proposed system used to presented. Later the results are compared and discussed. Chapter 4 presents a novel approach using result and discussion images. In Chapter 5, a summary of the outcome of the proposed work is discussed. The future enhancements that can be done are also discussed.

II. LITERATURE REVIEW

Many project and system have been proposed in developing a critical area and home security system. With a common Motto, they have established a system by using various Processors and features. In [1], the authors Discusses

a system developed for remote surveillance of house using a raspberry pi 3. It is monitored to the entire system. The Result of the introduced concept successfully bypass an obstacle and also measure the distance from the obstacle to the robot. And webcam interfaced with RPI 3 robot will captured the images, Also the robot has been successfully controlled from remote place using Putty software. In [2], the authors describe a system an Object Tracking algorithm and how to evolve a set of voice commands for moving the differential drive-based wheels of the robot. Voice-commands are given as an input side of the Android OS based platform which are handled and transmitted to cloud server in realtime. The voice-commands change to text form are then communicated to an onboard Bluetooth module of the robot, using the Blue-tooth module of the smart-phone. The Bluetooth module of the robot receives the commands in the form of text and then sends the command to the controller for future Operation. The speed control mechanism controlled through a software ensures stopping the robot before a pre-set differential delay-time. In order to make the „Object Tracking” more robust and ensure its range of applications more dynamic, better algorithms are being developed.

In [3], The author says that the robotic arm can be controlled using Raspberry pi, android application and WIFI. Raspberry pi is used for controlling of overall system. Smart phone with Android application is used as input for the system. Using this application user can give input to the system through commands. By taking input from smart phone raspberry pi controls the robotic arm according to given input. Android application and WIFI is used for remote control.

In [4], the author says that a robot to understand voice commands, the robot has to have speech recognition capability. A short review of speech recognition methods and available speech recognition software is discussed here. In addition, aspects of voice recognition connected with natural language interfaces for robot control are analyzed. As an example, a real movable robot system is presented. In this system voice communication is realized using a computer, with a mobile phone attached via modem and sound cards. Because the process of voice recognition depends on received sound quality, a comparison of voice commands transmitted via different mobile phones was performed.

In [5]. The author presents a robot assistant that will help the needful in hospitals, care facilities and homes. The main objective is to develop a voicecontrolled machine to overcome the disability or immobility. HuBot is a wireless robot that helps a patient by performing the tasks by taking user’s voice as input. HuBot is designed as a wireless voicecontrolled robot using, RF module. HuBot can be used

effectively with voice commands and is designed and developed with a vision to help and support the people and is developed with low cost so that it can be accessible to the people very easily.

III. SYSTEM DESIGN

In this planned system, Nodemcu ESP8266i is put in with a Blynk application account with the IFTTT web site then adding to Google Assistant for voice commands. Voice command controls the robots. System consist of following devices,

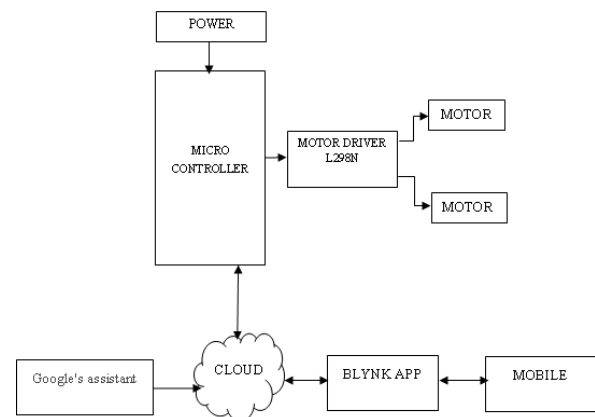


Figure 1 Block diagram for proposed system design

Nodemcu ESP8266

NodeMCU is an open-source firmware and development kit that helps you to prototype or build IoT products. It includes firmware that runs on the ESP8266 Wi-Fi SoC from Espressif Systems, and hardware which is based on the ESP-12 module. The firmware uses the Lua scripting language.

- Finally, programmable WiFi module.
- Arduino-like (software defined) hardware IO.
- Can be programmed with the simple and powerful Lua programming language or Arduino IDE.
- USB-TTL included, plug & play.
- 10 GPIOs D0-D10, PWM functionality, IIC and SPI communication, 1-Wire and ADC A0 etc. all in one board.
- Wifi networking (can be used as access point and/or station, host a web server), connect to internet to fetch or upload data.
- Event-driven API for network applications.
- PCB antenna.

B) DRIVER L298

The L298 is an integrated monolithic circuit in a 15-lead Multiwatt and PowerSO20 packages. It is a high voltage, high current dual full-bridge driver designed to accept standard TTL logic levels and drive inductive loads such as relays, solenoids, DC and stepping motors. To drive the robot, motors are required and to drive the motors, motor driver IC's are required. As the current delivered by the microcontroller is too low and the motors require high current, motor driver IC's are used as they act as current amplifiers which take in low current input and provide high current output which is sufficient enough to drive the motors. The motor driver IC used in this project is the L293D which is a dual H-bridge motor driver IC. And also, Automatic Thermal shutdown is available.

IV. RESULT AND DISCUSSION

Prototype consists of a voltage regulator circuitry with L293D motor driver and raspberry pi. The real time voice will be based on the mobile Application. And Button control are displayed in the webpage which can be viewed from anywhere in the world using internet or within the Wi-Fi range and one can control it using those control provided.

Step 1: Build the Robotic unit, we can use DC Motor based simple robot. To control your motors, we need L293D IC. Here we used L293D ICs for controlling two motors. And using the GSM module for sending the alert Message.

Step 2: Connection of power Supply. Here we used 9v rechargeable battery for driving the motors. But as per specifications Pi will work on 5 V, So we use IC 7805 for this and also an external portable battery bank can be used directly. We connect battery terminals directly to motor driver IC.

Step 3: Now design the control page that provides a way to control our robot this page is designed with PHP and write the controlling of the robot code based on the L293D IC logic used. At the same time, also design the voice-based command Android application by using the Google assistance.

Step 4: Setting up the nodumcu and installation of operating system from raspberrypi.org.

Step 5: Install the required packages in the pi using suitable commands.

Step 6: Connect a Wi-Fi dongle to connect nodemcu with Wi-Fi router. After connecting Wi-Fi dongle to PI, open WiConfig application this application is pre-installed in connect your nodemcu with your Wi-Fi router. When it is connected with Wi-Fi router, IP Address can be found using config command.

Step 7: Once we got the IP address we can use it for controlling purpose.

Step 8: nodemcu gets turn on as soon as you connect 5V supply; you can see green LED blinking while startup process. After some time, open browser in your Laptop or mobile and write down following link: IP address /filename. Now sitting in any place, you can control the robot either voice or web page through android mobile, anywhere in the world

Fig (8) shows the Mobile screen for controlling the robot based on the voice command with the button command android app. And then fig (9) shows the controlling of the robot through web page (Button) by using the IP Address.



Figure 2 Google assistance based control module

Proposed system working module consist of three different types of architecture inbuilt in single modules they are, it consist of three module they are,

First module:

First module robot respond forward , backward, left and right voice give it to the nodumcu module will work based on the voice inputs robot will worked corresponding commands.

Second module:

In this module we are using two different types of command used to navigate the room like based on location 1st comment go to bedroom and 2nd command go to kitchen.

Based on this comment robot navigate and send to the corresponding located rooms.

Third module:

Third module is where are comment sent to the robot using google assistance voice. The google assistance read that voice send to the nodemcu controller. Immediately robot will alarmed the buzzer user identified to the robot place.

V. CONCLUSION

According to this system, a smart voice control robot system is deployed into the Nodemcu ESP8266 using the Blynk App account with the IFTTT website and Google assistance API within it. Through which a user can access the robot just by giving the voice controls input. The result shows that robot can successfully detect and avoid the hollow pit & obstacles using the distance measured by itself from the obstacle. By analyzing the distance, the robot will send a message to the user. If the user gives the voice command from the input side, the robot take the action based on the user command until it does not move Also, the robot has been successfully controlled from remote place using google assistance.

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