G-BOT - Google Voice Assistant controlled Bot

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ABSTRACT

Internet of Things allow many number of ''things'' to communicate with each other and transfer data over existing internet or compatible network protocols. Because of technologies making advancement in all fields, unmanned vehicle and bot studies are continuing every day. They are used where manual work is not required . These bots can be controlled remotely or autonomously with the help of controller and sensors on them. In our implementation we made a voice-controlled robotic tank controlled using a smartphone, Google Assistant, IFTTT, and Adafruit.io platforms.

KEYWORDS

Internet of Things ,Google Voice Assistant, IFTTT , Adafruit.io

1. INTRODUCTION

Recent years have seen a significant increase in the use of voice-controlled Digital Assistants. Believe it or not, in today's world you can interact with your machine. What is interacting with a machine? Obviously giving it some input, but what if the input is not in the conventional way of typing, rather it is your own Voice. What if you are talking to the machine, giving it commands and wanting the machine to interact with you like your assistant?. An easy access to machine with voice commands is the revolutionary way of human system interaction.

Understanding the importance of this we have implemented a system which move left,right,forward and stop just by speaking with it. This device can be very handy .We have created small applets connecting web services and devices using IFTTT, created database using Adafruit.IO and used Arduino IDE to program the WEMOS.

2. DESIGN

2.1 Hardware Components
2.1.1 Wemos D1

Wemos D1 board is really easy to use and program with Arduino IDE. It has the same footprint of and ordinary Arduino Uno. This way most of Arduino shield will also work with this board. It has built-in Wi-Fi module, so you can use it in a variety of projects.

2.1.2 Robot Chassis

This kit has with everything you need to built a tank: two DC motors, gears, tracks, bolts, nuts, etc. It already comes with the tools need for assembling the chassis.

2.1.3 L298N H-Bridge

This module allows the 3.3V signals from the Wemos (or an Arduino) to be amplified to the 12V needed for the motors.

2.1.4 12V DC Motors

A DC motor is any of a class of rotary electrical machines that converts direct current electrical energy into mechanical energy.
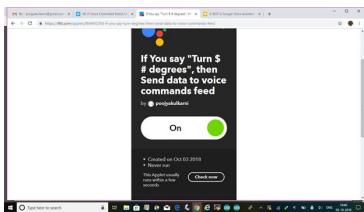
2.1.5 3.3V Battery

It is used to power the whole circuit. This tank uses 12V motors. We used two 3.7V batteries in series for powering them.
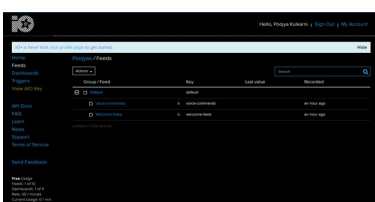
2.2 Software Used
2.2.1 IFTTT

Short for "If This, Then That,"IFTTT is the free

way to get all your apps and devices talking to each other. IFTTT is also completely free, and well supported. IFTTT will have some triggers configured and send some data to Adafruit.IO platform when a given logic is true. The gadget will be able to read the data stored in a given feed on Adafruit.IO, execute some logic and perform some actions.In our project "this" represents a service that will trigger a given action given by "that". This way you create small applets connecting web services and devices. Google Assistant to send voice commands from a smartphone to Adafruit.io, which is then received by the bot.

2.2.2 Adafruit.io

Adafruit.io is a cloud service - that just means

we have to run it and we don't have to manage it. You can connect to it over the Internet. It's meant primarily for storing and then retrieving data.In our project it is used primarily to control motors,connect projects to web service,display data in real-time.

2.2.3 Arduino IDE

The open-source Arduino Software (IDE) makes it easy to write code and upload it to the board. It is similar to C code.It is used to program the Wemos.Arduino IDE comes with support to a lot of different boards.Unfortunatly ESP8266 isn't by default among those supported development boards. So in order to upload your codes to a ESP8266 base board, you'll have to add its properties to Arduino's software first.

2.2.4 Google Voice Assistant Application

Google Assistant is a virtual assistant developed by Google. It's artificial intelligence is able identify voice commands, perform searches and other tasks. It has a great integration with IFTTT service.

2.3 OVERALL SYSTEM DESIGN

A bot is constructed as shown in the diagram. A power pack made of two batteries is installed on the base of bot. It provides 7.4V (2 x 3.7V) to the bot. That's enough to power the 12V DC
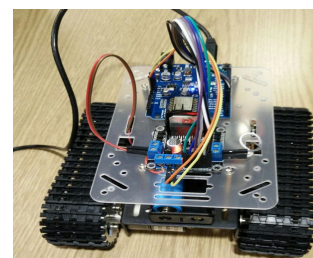
motors. A L298N dual channel H-bridge is used for the control of the motors. It receives some 3.3V signals of the Wemos board, and provide higher voltages for the motors. It also allow the motors to run in both directions, depending on the combination of input signals.

3.IMPLEMENTATION
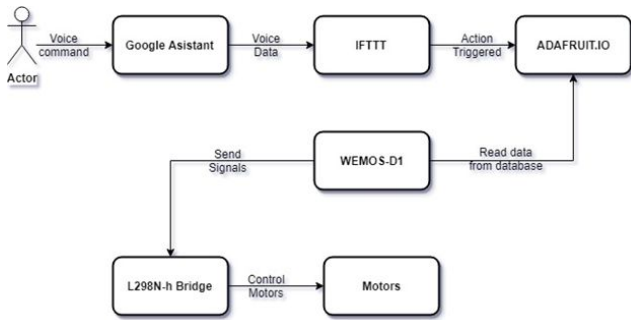
The overall implementation is as shown in the diagram. The actor or the user gives the voice commands with the help of Google Voice assistant. Then the voice data is sent to IFTTT which triggers data to Adafruit database. This works on the principle of logic where "this" represents a service that will trigger a given action given by "that". In the applet we provide two ingredient:one for text field and another numerfield.The first one is for directions like forward,left and right directions and second one is for the degrees the bot has to turn. So when this command is given the data is sent to Adafruit database,which is stored in the feed created as voice-commands feed. The data from database is sent to Wemos for processing further, which will inturn give commands to the motors to move in the specified direction and degrees.

4. EVALUATION

The proposed system passed the benchmarks. We have developed and evaluated the "G-Bot" in the real world. The system is flexible as almost every person has a smartphone and the bot is minimal cost. The demonstrated system is sending data to the Processor, which is received by the bot properly,which is a key achievement we have accomplished. This system can be used in future where people can't reach easily.

There are some disadvantages also: First, the Google assistant is not fully improvised to capture the language accent perfectly.So the commands must be given properly otherwise the system cannot recognise the commands.

5. CONCLUSION

The main aim of this project was to develop a voice controlled bot using google assistant. At the end of whole development, we can say we have successfully accomplished the main target of our project. We have understood the working of the Wemos board, Esp8266 WiFi module. For communication we have IFTTT, Google Assistant and Adafruit as our database. Moreover, we have demonstrated our system as expected. The main challenge was to move bot in correct direction as per the direction specified by the user.

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