Arduino Based Google Assistant Robot

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Abstract— Nowadays technology is progressing day by day to a next level every day. Further towards technology we have introduced Wi-Fi controlled robot using google assistant as our contribution in this digital era. This Wi-Fi controlled robot will be seen as beneficial in different aspect of fields such as it will do works of human immensely easier than before by giving just one command through google assistant in our phones. The project is basically based on a robot which is controlled with the help of google assistant. One should command google assistant to move the robot.

Keywords: WeMosD1, L293D Motor Driver, IFTTT, Adafruit

I. INTRODUCTION

In recent years, the use of internet and digital communication has increased to a greater extent. Human interaction with machines has also increased which majorly lead to use of voice controlled digital assistants. Interaction with machines not only includes giving input by typing commands but it also includes giving commands over voice and actions. What if the machine obeys all our commands just like our personal assistant? So here in this paper we have used Google Assistant as voice controlled digital assistant. In this paper we've designed a robot that may be controlled by Google Assistant. A robot is a machine designed to execute one or additional tasks mechanically with speed and precision. We will give voice command to Google Assistant to move the robot to a particular direction, Google assistant will convert this voice command into text and pass it on to IFFFT. Depending on the command received, IFTTT will make different HTTP requests to the robot which is controlled using Arduino that is been connected to the home Wi-Fi network. These requests are received by the Arduino and the Arduino drives the motors of our robot using an L293D driver.

II. LITERATURE SURVEY

The literature study for "Arduino based google assistant robot" revealed the studies and efforts made by the researchers in these following papers.

1) Mr. Ananthapadmanabhan J, Ms.Annu Mariam Abraham , Mr. Libin M George , Ms. Vineetha Anna Saji , Prof. Anil A R, "Smart Robotic Assistant Using IoT", (IRJET), Volume: 04 Issue: 06 | June -2017

Abstract: In this paper, a smart robotic Assistant using IoT is developed. The robotic assistant operates on commands given by human voice and gestures which are given by IoT devices.

2) Manish Prakash Gupta, "Google Assistant Controlled Home Automation", (IRJET), Volume: 05 Issue: 05 | May- 2018

Abstract: This paper proposes a method for Home Automation using voice commands given by google assistant. 8 appliances can be controlled using this system with the help of IFTT and Microcontroller and the connection is established using Wi-Fi.

3) Harsh Bhatia, Zarana Matani, Priyank Bhatt, Yash Nasarpuri, "HuBot – Voice Controlled Human Assistant", International Journal of Innovative Research in Computer and Communication Engineering, Vol. 5, Issue 6, June 2017.

Abstract: In this paper, Wireless robot called as HuBot is developed which will help in taking care of patients in hospitals as well as in other places. Using RF Module a wireless robot is made which operates on voice commands with low cost.

III. SYSTEM DESIGN AND IMPLEMENTATION.

The system design comprises of two main sections:

1) Hardware: The hardware components used in this paper are WeMos D1 module, L293D Motor Driver IC, Batteries, DC Motors.

2) Software: The softwares used in this paper are IFTTT, Adafruit.Io, Arduino IDE, Google assistant.

The project uses google assistant activation which is interface with Arduino. Once the command is given to the google assistant, the command is send to Arduino. Arduino sends the command to adafuit.io where the data login server in which the commands are already set.

The adafruit.io reads that commands and send it to IFTTT, IFTTT take the action for the given command and request to the Arduino to move the robot, Arduino commands the motor driver to move the robot according to given commands.

A. WeMos D1:

The WeMos D1 is an ESP8266 Wi-Fi based board that uses the Arduino layout with an operating voltage of 3.3V.

1) Features:

1) 11 Digital input/output pins, all pins have interrupt/pwm/l2c/one-wire supported(except for D0)
2) 1 analog input(3.2V max input)
3) Micro USB connection
4) Power jack, 9-24V power input
5) Compatible with Arduino
6) Compatible with NodeMCU

2) Specifications:

Microcontroller	ESP-8266EX
Operating Voltage	3.3V
Digital I/O Pins	11
Analog Input Pins	1
Clock Speed	80MHz/160MHz
Flash	4M bytes
Length	68.6mm
Width	53.4mm
Weight	25g

3) Pins:

All the I/O pins runs at 3.3V and have interrupt/PWM/I2C/one-wire support except D0.

PIN	FUNCTION	ESP-8266 PIN
TX	TXD	TXD

RX	RXD	RXD
A0	Analog input, max 3.3V input	A0
D0	IO	GPIO16
D1	IO,SCL	GPIO5
D2	IO,SDA	GPIO4
D3	IO,10K Pull-up	GPIO0
D4	IO,10K Pull- up,BUILTIN_LED	GPIO2
D5	IO,SCK	GPIO14
D6	IO,MISO	GPIO12
D7	IO,MOSI	GPIO13
D8	IO,10K Pull-down, SS	GPIO15
G	Ground	GND
5V	5V	-
3V3	3.3V	3.3V
RST	RESET	RST

B. L293D IC:

A motor driver IC is an integrated circuit chip which controls the motors in the robots. Motor driver IC's act as an interface between microprocessors and the motors in the robot. Here in this paper we are using L293D IC. It is a 16 pin IC which consists of four ground pins, four input pins, four output pins, two enable pins and two voltage pins.
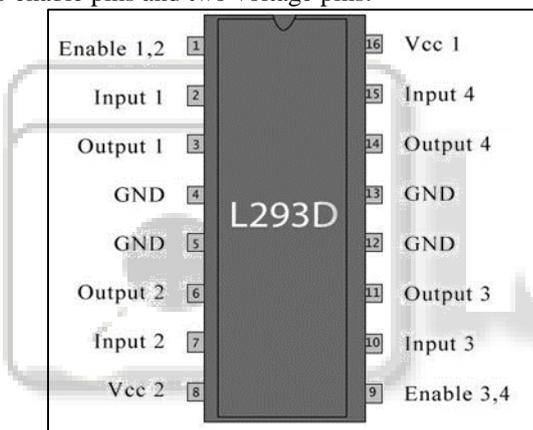
The L293D IC receives signals from the microprocessors and transmits the relative signal to the motors. It consists of two voltage pins, of which one is used to draw current for the functioning of the L293D and the other is used to apply voltage to the motors. The L293D changes its output signal according to the input received from the microprocessor.

C. IFTTT:

If This Then That, also referred to as IFTTT may be a free web-based service to create chains of simple conditional statements, known as applets. It is free to use and completely well supported. We can create our own triggers and they are configured and sent to Adafruit.Io once the logic is true. The gadget will read the data stored in Adafruit.Io and will perform actions accordingly. Triggers are the "this" part of an applet. They are the items that trigger the action. Actions are the "that" part of an applet. These are the outputs that results from the input of the trigger given. Applets are the predicates made from Triggers and Actions. Google assistant is used to send voice commands over smartphones to Adafruit.Io which is further received by the robot.

D. Adafruit.IO

Adafruit.io is a free cloud service which we can run without managing it. It is connected over the internet and can be used to store and retrieve data. It acts as an intermediate service between the voice commands given by the google assistant and the robot. It displays data in real time, online and also makes the project internet connected which controls the motors.

E. Arduino IDE

The Arduino integrated development environment (IDE) is an application that is written in various programming languages such as Java, C and C++. Using Arduino IDE board we can write and upload computer code to the physical board. We need to add additional esp8266 board on Arduino ide to make it compatible.

F. Google Assistant:

Google Assistant is the new way of searching with Google. Other than providing links to websites, Google Assistant is designed to have conversations with user in order to complete the tasks. Google Assistant is activated by long pressing the home button or home icon of your phone. Hold the button, and Google Assistant will ask you to give voice command or type and then the search process will begin.

IV. RESULT

We have designed and successfully tested "Arduino based google assistant robot". The system is easy to use and can be used by any person having a smart phone. The cost of this system and the robot is also minimum. These robots can be
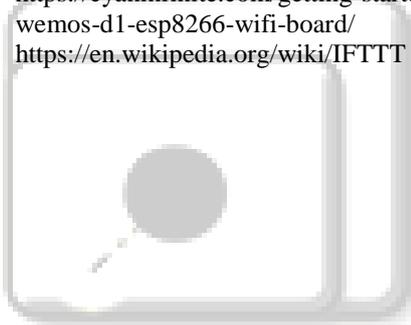
used for various applications such as in hospitals, military usage and also in automation of household tasks.

V. Conclusion

The main aim of our project was to design an Arduino based google assistant robot and we have successfully implemented it. We have used WeMos D1 controller to control the google assistant using Wi-Fi and it is combined with L293D driver which drives the motors so that the robot moves in the direction giving to the google assistant by voice commands.

References

[1] Mr. Ananthapadmanabhan J, Ms.Annu Mariam Abraham , Mr. Libin M George , Ms. Vineetha Anna Saji, Prof. Anil A R, "Smart Robotic Assistant Using IoT", (IRJET), Volume: 04 Issue: 06 | June -2017

[2] Manish Prakash Gupta-" Google Assistant Controlled Home Automation", (IRJET), Volume: 05 Issue: 05| May-2018

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