



Convo Hand – Smart Glove

Aditi Naik, Vanshika Nair, Nidhi Mishra and Abhinav Dubey

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CONVO HAND – SMART GLOVE

Aditi Naik¹

Thakur College of
Engineering and
Technology, Mumbai, India
aditinaik0604@gmail.com

Vanshika Nair²

Thakur College of Engineering
and Technology, Mumbai,
India
vanshikanair46@gmail.com

Nidhi Mishra³

Thakur College of Engineering
and Technology, Mumbai,
India
missmishra1999@gmail.com

Abhinav Dubey⁴

Thakur College of Engineering
and Technology, Mumbai,
India
abhinavdube98@gmail.com

Abstract-In this paper we represent smart glove for deaf and dumb patient. About nine billion people in the world are deaf and dumb. The communication between a deaf and normal visual people. This creates a very little room for them with communication being a fundamental aspect of human life. The blind people can talk freely by means of normal language whereas the deaf-dumb have their own manual-visual language known as sign language. The smart wearable glove will solve many issues related to different fields like healthcare, defense sector, automation, public safety, control systems and many more. Once, it comes in public domain then it will truly change the life of many and will encourage such innovative projects and ideas so that more and more similar product is introduced for the benefit of the society.

Keywords- Smart Glove; Solutions for Deaf and normal visual people; Gesture Vocalizer App; ConvoHand;

I. INTRODUCTION

The internet of things (IOT) is a computing concept that describes the idea of everyday physical objects being connected to the internet and being able to identify themselves to other devices. The IOT is significant because an object that can represent itself digitally becomes something greater than the object by itself.

General, deaf people have difficulty in communicating with normal people. Even those who do speak aloud typically have a “deaf voice” of which they are self-conscious and that can make them reticent. Hence there is a need of the system which recognizes the different signs and conveys the information to the normal people.

The ConvoHand glove is a normal glove with buttons along the length of each finger and the thumb. Buttons are used instead of flex sensors to make the product cheaper. The button output a stream of data that varies with ASCII code. The output from the button are analog values, converted to digital and processed by using microcontroller and then it will be transmitted through Bluetooth wireless

communication, then it will be received in the receiver section and processed giving the output. The output is been shown in an app called CONVOHAND which is made through MIT App inventor-2, the responses are in text and voice. In this project buttons plays the major role.

Analysis is the third phase in software development lifecycle which aims in finding the requirements for the project which we are going to implement. Analysis means to understand the business needs and processes so that the project we implement becomes efficient. In system analysis we consider what the system will need to take into consideration all the points so that the stakeholders will have the right model built That signifies to collect the requirements which reflects the stakeholder's expectations. So, in this phase we spent considerable amount of time talking with the customers and understanding their requirements. In short, we can say that analysis phase means conquering requirements and analyzing them. So, in analyzing requirements we create the deadline and consider various ways to achieve it and hence the requirements are considered formal requirements.

II. OBJECTIVE

The main objective of this project is to help deaf and dumb people by removing communication barrier so that they are not restricted in a small social circle and are able to convey their feelings and emotions . This project also aims to solve the daily challenges faced by the people, who are unable to speak (dumb) or one who has recently undergone an accident and is unable to speak. It can also be used by elderly people, who find difficulty in speaking. Whenever they want. Also it would be helpful in education and health issues related to deaf and dumb people. Assertive technology products for special people to promote building an inclusive society. This work includes a voice based and text based interaction approach.

III. SCOPE

To achieve the objectives, the scope of this project is determined. With this wearable smart glove, dumb people or patient can easily communicate by just tapping the points on the glove by their thumb that results in 4 different commands that are both audible audio and image on any Android smartphone via an app. This can also be used in automation of day to day things like home appliances and many more. This can also be integrated in the field of automation where one can automate things without getting in direct contact of the machines/appliances that are to be automated or controlled.

IV. PROBLEM DEFINATION

Problems faced by the disable person regarding employment can be overcome by our method. So in the implemented work an intelligent microcontroller based system using Flex sensors is developed which is able to convert gesture into voice and text. Help a person to control his home appliances if he could not walk to switchboard. In today's technology wireless gloves are not yet reliable because to be used as wireless, the gloves should have inbuilt battery and some electronics controller board which makes gloves heavier and may cause irritation. Thus wired equipment's are preferred for patients and partial disable people.

V. OBSERVATION MATRIX

A. Observation

In the society, we observe that many problems occurred while communicating with deaf and dumb people.

- Unable to convey the message
- Takes time to understand
- Time wastage
- Less security
- Less safety

B. Scouted challenges

In current technology we face the many problem.

- More reliable
- Automatic system
- Fast working
- Less time consumes
- Security
- Base planning

C. Top Five problems

There are many problems with these people. Problem like

- people like this can't get the employment.
- At least one person is required to understand the person.
- Delay in understanding may lead to unexpected problems.
- Patient in hospital always requires an assistant.
- People may take the advantage of their disability.

VI. FEATURES OF THE PROJECT

It can solve the daily difficulties suffered by the people, who are cannot speak (dumb) or one who has recently undergone an accident and is not in a condition to speak about this health to the doctor or express his feeling to his family. It can also be used by elderly people, who find difficulty in talking due to their bad health conditions.

This can also be integrated in the field of automation where one can automate things without getting in direct contact of the machines/appliances that are to be automated or controlled.

It has wide application in defense sector and war equipment, where soldier will not put their life in danger and can control the artillery or explosive without coming in direct contact of it from a safe distant zone. This smart glove can also work as a controller for Wheel chair and stuffs that are wheeled and needs to be controlled by gestures in some critical or required situation.

So, this glove can easily communicate by just tapping the points on the glove by their thumb that results in twelve different expressions/commands in text, image and audio format on any android smartphone via an app. But, its application possibilities are more in different fields.

VII. SYSTEM REQUIREMENT

A. Software

There are two main software used in developing this project which are Arduino software and MIT App Inventor. Arduino software used to write the program using C language and Arduino language. It is used to compile and install the program into the microcontroller. It will display the value of button and make the project easier to be tested.

The MIT App Inventor, online app development application software. The application has two parts.

1. Screen Layout.

2. Blocks.

The MIT App Inventor development environment is supported for Mac OS X, GNU/Linux, and Windows operating systems, and several popular Android phone models.

B. Hardware

There are five main hardware in this projects.

1. Arduino UNO
2. Bluetooth module HC-05
3. Jumper wires
4. Glove and Metallic Buttons
5. Soldering Iron

VIII. IMPLEMENTATION FOR METHODOLOGY

A. Flow of the project implementation:

1. Connect the battery to the Arduino Uno.
2. on the Arduino and Bluetooth.
3. Open ConvoHand app and touch any one button make the app active.
4. Let the required person wear the glove and use the glove as it is required.

B. Block Diagram:

The figure 4.2 shows all the connections from the glove and the Bluetooth module HC-05 to the Arduino Uno. The color of the wire shown the figure 4.2 is identical to the wire in the working model.

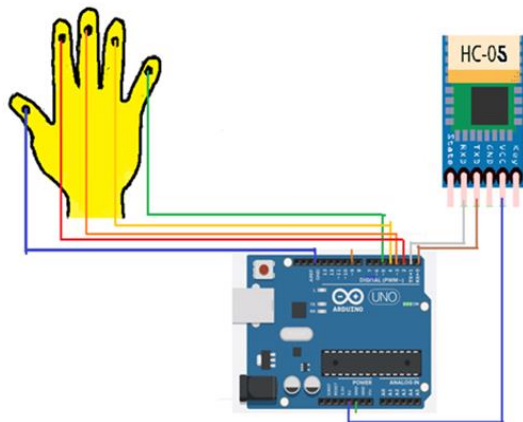


Fig1. Block Diagram of working model

C. Arduino UNO:

Arduino Uno is the main part of this project which it act as microcontroller. Since the price is very cheap and easy to use, it is very good for the development of new products or interesting projects. Coming with 14 digital pin, 6 analog pin, 16 MHz crystal oscillator and USB connection, it is suitable to be used as a

microcontroller. Based on ATmega328, this microcontroller board can simply connect to computer using USB cable or using adapter to connect with battery to get started.



Fig 2. Arduino UNO

D. Bluetooth Module HC-05:

The Bluetooth module HC-05 is a MASTER/SLAVE module. By default the factory setting is SLAVE. The Role of the module (Master or Slave) can be configured only by AT COMMANDS. The slave modules cannot initiate a connection to another Bluetooth device, but can accept connections. Master module can initiate a connection to other devices. The user can use it simply for a serial port replacement to establish connection between MCU and GPS, PC to your embedded project, etc.

HC-05 FC-114

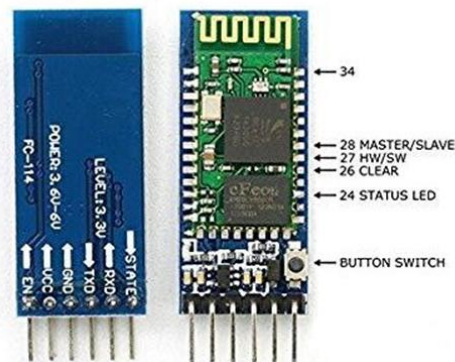


Fig3. Bluetooth Module HC-05

E. Glove and Metallic Button:

This project has been made by using plastic and rubber glove. We can also use woolen glove as per convince. Metallic buttons has been attached to this glove in order to make the connection. On the backside of buttons we have solder electrical wires so that message can be passed using electrical medium.



Fig4. Glove and the Metallic buttons

F. Android App -MIT App Inventor:

The MIT App Inventor, an online app development application where developer can drag- drops the layout of Android app as the requirement of the developer. The MIT App Inventor project seeks to democratize software development by empowering all people, especially young people, to move from technology consumption to technology creation. The app can be cloned to an Android phone using MIT AI2 Companion that can be downloaded from Android Play Store, showing how exactly it looks on an Android phone. If you don't have an Android phone, you can build your apps using the Android emulator, software that runs on your computer and behaves just like the phone. The MIT App Inventor development environment is supported for Mac OS X, GNU/Linux, and Windows operating systems, and several popular Android phone models. Using MIT App Inventor, developer can make his own Android app using Build option using a QR code using .apk.



Fig5. Android App

G. CONVOHAND APP:



Fig6. Display page of the CONVOHAND App

This is the first page of app. The first line of page include title of the app the second line shows virtual voice which means it will convert the message in voice message for users. A different command has different voice messages.



Fig7. Command 1

This page shows the result of command touched by the user. 8 128 128 128 is the code value with convert the number from Arduino to app and helps to display the correct message.



Fig8. Command 2

IX. RESULT ANALYSIS

As result of the project we are able to achieve wearable smart glove. Which is not only useful for deaf and dumb but also for people who don't get any employment. This smart glove is connected with android app which can be get transmitted through and android phone. Cost of this glove is very less as compare to other replacement available in market. Rather than using any sensor this glove has been developed with the help of metallic buttons which is very cheap.

Thus, the smart wearable glove will solve many issues related to different fields.

Once, it comes in public domain then it will truly change the life of many and will encourage such innovative projects and ideas so that more and more similar product are introduced for the benefit of the society.



Fig9. Result of working model

X. OUTCOMES

PHASE 1:

i. Analysis:

Creating the synopsis, literature survey and feasibility study for proposed solution which will act as an input to the design phase.

ii. Planning:

Proposing Statement of work, scope definition and scope boundary for planning the prototype from the problem definition to decide what needs to be done and what not to be done.

iii. Designing:

Proposing the design architecture for the prototype.

iv. Implementation:

Implementation of Arduino UNO with the help of code running in the Arduino IDE environment.

PHASE 2:**i. Testing:**

Testing was done by sending messages multiple times to the GSM module. The testing of the model successes are mentioned in the above figures.

ii. Deployment:

When a real-time notice is sent to the GSM Module, it is extracted and sent to Arduino, which is displayed on the LCD Screen. Thus, the model works efficiently.

XI. CONCLUSION

With CONVOHAND: Smart Glove we are able to help disable person in their daily work. As it is difficult to monitor and understand disable person, with ConvoHand he/she can easily communicate with others to express their feelings. This is achieved by making the glove consisting a button on each finger carrying a specific message which could be pressed and displayed on the screen to the concerned person. These messages are going to be displayed via app named "CONVOHAND" which was built on the application known MIT APP INVENTOR. This app has been connected with Arduino by Bluetooth module. This project is really helpful in medical field as well as in the customer care field.

XII. REFERENCES

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