

# Automated Gesture Control System Using IOT

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## ABSTRACT

All finished world, deaf and dumb individuals confront battle in communicating their emotions to other individuals. There are different difficulties experienced by discourse and hearing weakened individuals at open places in conveying everything that needs to be conveyed to ordinary individuals. The answer for this issue is resolved in this paper, by the utilization of the Indian gesture based communication images which are bland to all deaf and dumb individuals in India. The motions outlined by the Indian gesture based communication images will be vanquished with the help of the flex sensors and accelerometer. The developments included amid signal portrayal are turn, point tilt, and heading changes. The flex sensor are consolidated over fingers of two and accelerometer sensor over the wrist separately to obtain their progression, a these sensors are fitted over the information glove. The one hand fingers are utilized to control home apparatuses like light fan and entryway while the other hand finger are utilized to send message. These voltage signs will then be handled by microcontroller and sent to cloud server, where the words yields are put away and play upheld equal to each word esteems to create the proper words with the assistance of the speaker. The accelerometer sensor joined over hand is utilized to control development of wheel seat and ultrasonic sensor stops that seat to crash into obstacles.

**Keywords:-** IOT, Gesture

## I. INTRODUCTION

Impairment is a condition that influences numerous individuals around the globe. This condition prompts the loss of the profitable sense organs. Worldwide in excess of 160 million individuals are outwardly debilitated with 47 million cant ready to walk and 20 million are dumb and deaf. There is a requirement for assistive devices was and will be consistent. In this proposed work we have actualized the signal controlled home mechanization utilizing Arduino through the microcontroller. Taking in concern the everyday difficulties on the planet with developing advances in ordinary life, the accompanying proposed work was made. The issue of inability is increasing increasingly significance everywhere throughout the world. In the meantime there is a system of Non Governmental Organizations working for the improvement of people with physical handicaps. In this way giving answer for the ineptitudes is the prime moto of this work. Motion assumes a noteworthy part in this proposed work. A motion is a type of nonvocal correspondence in that human body activities can have the capacity to convey the specific discourse or correspondence or

even messages. Signals incorporate development of the hands, confront, or different parts of the body. Motions enable people to convey an assortment of sentiments and contemplations, from scorn and antagonistic vibe to endorsement and fondness. There are different applications which could be controlled by a motions incorporate media players, remote controllers, robots, and so on. Signal acknowledgment is the scientific understanding of a human movement by a processing gadget. At the end of the day, interface with PCs or other hardware utilizing motions of the human body, regularly hand developments. In the motion acknowledgment innovation, a camera peruses the developments of the human body and imparts the information to a PC that uses the signals as a contribution to control devices or applications.

## II. LITERATURE SURVEY

As our framework depends on controlling home machines and wheelchair utilizing our own particular hand signals, we looked into on existing strategies used to control the home apparatuses and wheel seat.

In prior, we used to control the home apparatuses utilizing satisfaction sticks and console in which there is wired association amongst transmitter and collector with the goal that equipment required and general many-sided quality would build so general cost of the framework likewise increments. Afterward, home apparatuses are controlled will be controlled by remote based framework which are remote so many-sided quality would diminish contrasted with before technique ,yet in our undertaking we control wheel seat and home machines just by utilizing our hand motions by adding a quintessence of IOT to it .

### III. EXISTING SYSTEM

#### A. Bluetooth based home automation and wheel chair control:

In this method we can just control home apparatuses and wheelchair just up to some specific range that is just up to Bluetooth associated region however in our project we can control from anyplace on the planet utilizing IOT.

#### B. Remote based home automation and wheel chair control:

In this method we can just control home apparatuses and wheelchair just up to some specific range that is by utilizing certain sensors we can robotize the gadget just up to specific ranges however in our project we can control home machines from anyplace on the planet utilizing an adafruit server

#### Disadvantages :

In spite of the fact that above said methods gives robotization and control of wheel seat however they give just up to certain range and it additionally don't distinguish any deterrent in the way at the same time, our project is fit for numerous applications with a basic and minimal effort and power compelling equipment framework .Moreover, it is utilized for a wide range of impaired individuals like appendage person,deaf and dumb individual and outwardly impaired individual.

### IV. PROPOSED SYSTEM

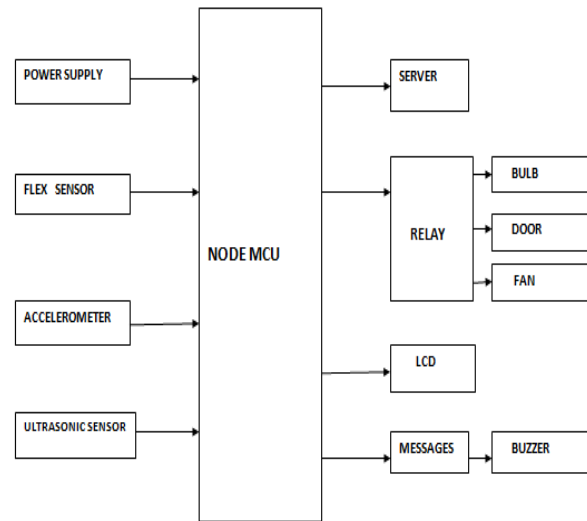


FIG.1:Block Diagram

#### A.ESP-12E Wi-Fi Module (NODE MCU)

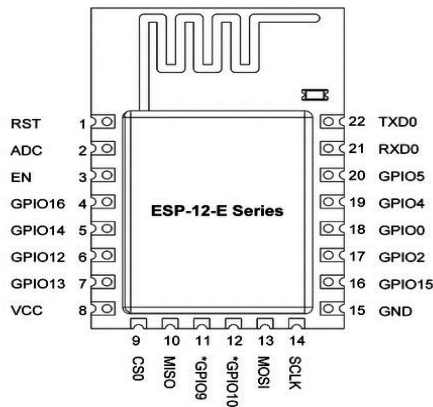
ESP-12E Wi-Fi module is developed by Ai-thinker Team. core processor ESP8266 in smaller sizes of the module encapsulates Ten silica L106 integrates industry-leading ultra-low power 32-bit MCU micro, with the 16-bit short mode, Clock speed support 80 MHz, 160 MHz, supports the RTOS, integrated Wi-Fi MAC/BB/RF/PA/LNA, on-board antenna

ESP8266EX is among the most integrated Wi-Fi chip in the industry; it integrates the antenna switches, RF balloon, power amplifier, low noise receive amplifier, filters, power management modules, it requires minimal external circuitry, and the entire solution, including front-end module, is designed to occupy minimal PCB area as shown in Fig



Fig .2:- ESP8266-12E

**B. ESP-12E Pin design:**



**Fig. 3:-Pin diagram**

**Pin Descriptions:**

**Table 1**

**Pin Description**

NO.	Pin Name	Function
1	RST	Reset the module
2	ADC	A/D Conversion result Input voltage range 0-1v,scope:0-1024
3	EN	Chip enable pin. Active high
4	IO16	GPIO16; can be used to wake up the chipset from deep sleep mode.
5	IO14	GPIO14; HSPI CLK
6	IO12	GPIO12; HSPI MISO
7	IO13	GPIO13; HSPI MOSI; UART0_CTS
8	VCC	3.3V power supply (VDD)
9	CS0	Chip selection
10	MISO	Salve output Main input
11	IO9	GPIO9
12	IO10	GPIO10
13	MOSI	Main output slave input
14	SCLK	Clock
15	GND	GND
16	IO15	GPIO15; MTDO; HSPICS; UART0_RTS
17	IO2	GPIO2; UART1_TXD
18	IO0	GPIO0
19	IO4	GPIO4
20	IO5	GPIO5
21	RXD	UART0_RXD; GPIO3
22	TXD	UART0_TXD; GPIO1

**C.Flex Sensor**

**Flexion sensors** also called **bend sensors**, measure the amount of deflection caused by bending the sensor. There are various ways of sensing deflection, from strain-gauges to hall-effect sensors.



**Fig .4:- Flex Sensor**

A simple flex sensor 2.2" in length as shown in Fig:- 3.3As the sensor is flexed, the resistance across the sensor increases. The resistance of the flex sensor changes when the metal pads are on the outside of the bend (text on inside of bend). Connector is 0.1" spaced and bread board friendly. Note: Please refrain from flexing or straining this sensor at the base. The usable range of the sensor can be flexed without a problem, but care should be taken to minimize flexing outside of the usable range. For best results, securely mount the base and bottom portion and only allow the actual flex sensor to flex.

**D.Accelerometer**

One of the most common inertial sensors is the accelerometer, a dynamic sensor capable of a vast range of sensing. Accelerometers are available that can measure acceleration in one, two, or three orthogonal axes. The basic figure in shown below in Fig:- 3.4.They are typically used in one of three modes:

- As an inertial measurement of velocity and position;
- As a sensor of inclination, tilt, or orientation in 2 or 3 dimensions, as referenced from the acceleration of gravity ( $1 g = 9.8m/s^2$ );
- As a vibration or impact (shock) sensor.



**Fig.5:-Accelerometer**

### E.Ultrasonic Sensor - HC-SR04

This is the HC-SR04 ultrasonic ranging sensor. This economical sensor provides 2cm to 400cm of non-contact measurement functionality with a ranging accuracy that can reach up to 3mm. Each HC-SR04 module includes an ultrasonic transmitter, a receiver and a control circuit as shown in Fig

There are only four pins that you need to worry about on the HC-SR04: VCC (Power), Trig (Trigger), Echo (Receive), and GND (Ground). You will find this sensor very easy to set up and use for your next range-finding project.



Fig.6:- HC-SR04

### F.Servo Motor

A **servo motor** is an electrical device which can push or rotate an object with great precision. If you want to rotate an object at some specific angles or distance, then you use servo motor. It is just made up of simple motor which run through **servo mechanism**. If motor is used is DC powered then it is called DC servo motor, and if it is AC powered motor then it is called AC servo motor. We can get a very high torque servo motor in a small and light weight packages. Due to these features they are being used in many applications like toy car, RC helicopters and planes, Robotics, Machine etc.

The position of a servo motor is decided by electrical pulse and its circuitry is placed beside the motor as shown in Fig

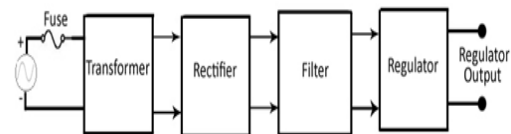


Fig.7- Servo motor

A servo motor is a linear or rotary actuator that provides fast precision position control for closed-loop position control applications. Unlike large industrial motors, a servo motor is not used for continuous energy conversion.

### G.Power Supply

An AC powered unregulated power supply usually uses a transformer to convert the voltage from the wall outlet (mains) to a different, nowadays usually lower, voltage. If it is used to produce DC, a rectifier is used to convert alternating voltage to a pulsating direct voltage, followed by a filter, comprising one or more capacitors, resistors, and sometimes inductors, to filter out (smooth) most of the pulsation as shown in Fig 3.7. A small remaining unwanted alternating voltage component at mains or twice mains power frequency (depending upon whether half- or full-wave rectification is used)—ripple—is unavoidably superimposed on the direct output voltage. For purposes such as charging batteries the ripple is not a problem, and the simplest unregulated mains-powered DC power supply circuit consists of a transformer driving a single diode in series with a resistor.





**Fig.8:-Block diagram of power supply**

### H.Buzzer

A buzzer is a mechanical, electromechanical, magnetic, electromagnetic, electro-acoustic or piezoelectric audio signaling device. A piezo electric buzzer can be driven by an oscillating electronic circuit or other audio signal source. A click, beep or ring can indicate that a button has been pressed

**Piezo buzzer** is an electronic device commonly used to produce sound. Light weight, simple construction and low price make it usable in various applications like car/truck reversing indicator, computers, call bells etc. Piezo buzzer is based on the inverse principle of piezo electricity discovered in 1880 by Jacques and Pierre Curie. It is the phenomena of generating electricity when mechanical pressure is applied to certain materials and the vice versa is also true.

### I. Holder or Lamp holder

Light bulb sockets, light sockets lamp sockets or lamp holders provide electrical connections to the lamps and support it in the lighting fixture. The use of sockets allows lamps to be safely and conveniently replaced (re-lamping). There are many different standards for these lamp holders, created by de facto and by various standards bodies. A general coding system is a letter or abbreviation followed by a number. Some miniature lamps have wire leads suitable for direct connection to wires as shown in Fig 3.8 some reflector lamps have screw terminals for wire connections.



**Fig. 9: A standard American three –way light bulb socket**

### J.Server: adafruit

You are connecting to Adafruit IO's MQTT server you could use another broker and as long as it fits the MQTT 3 or 3.1.1 specs, it ought to work. You are connecting via the Internet- Wi-Fi, Ethernet, and cellular are king here. Other transports would need a gateway You are using an Arduino or compatible - Our code is fairly portable, but it order to keep the examples concrete, we'll be focusing on the Arduino library You have already signed up for Adafruit IO and logged in Honestly, if this is your first time using MQTT, the above is a pretty safe way to get started!

### K.IFTTT

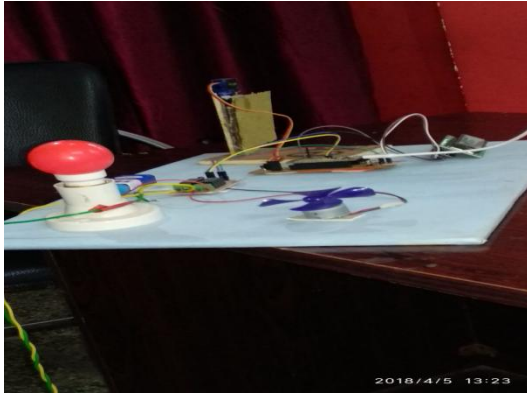
If This Then That, also known as IFTTT , is a free web-based service to create chains of simple conditional statements, called applets. An applet is triggered by changes that occur within other web services such as Gmail, Facebook, Telegram. For example, an applet may send an e-mail message if the user tweets using a hashtag, or copy a photo on Facebook to a user's archive if someone tags a user in a photo.

In addition to the web-based application, the service runs on iOS and Android. In February 2015, IFTTT renamed their original application to IF, and released a new suite of apps called Do which lets users create shortcut applications and actions .

### V.RESULT AND DISCUSSION



**Fig.10:Shows Controlling the Wheel Chair with Hand Gestures**



**Fig.11: The home appliances light, fan and door are automated by our hand gestures**

## VI. CONCLUSION

This paper displays another gesture controlled wheelchair and Home Appliances utilizing IoT with numerous additional focal points, for example, diminished multifaceted nature, simple controlling, ease and extraordinary unwavering quality contrasted with other traditional methods. . In the wake of outlining the circuit that empowers physically disabled to control their wheel seat with their own particular body gestures, for example, eye stare, leg development or head development appropriately. The recognition of any hindrance is effectively controlled by the microcontroller. As the individual switches on the circuit and begins moving, any obstruction which is relied upon to exist in a scope of 4 meters will be recognized by the Ultrasonic sensor, and it has likewise been tried and approved. Our proposed framework additionally utilized for Dumb and deaf individual to show his emotions on LCD alongside a vibration sensor to pass on a crisis . This proposed framework adds to the self-dependency of differently disabled and more established individuals in numerous applications, for example, healing facilities, seniority homes and airplane terminals and so forth

## VII. FUTURE SCOPE

Automated wheel chair can be worked with eye retina utilizing optical sensor that move the wheel chair accordingly with our eye motion. We can likewise utilize voice charges IC'S to interface our voice with microcontroller. In our project we have a

postponement of 10 seconds between every operation due to different applications be that as it may, in future we can utilize preferable server other over Adafruit to keep away from such delays. Research work is going ahead to control the wheel chair of the impaired individual utilizing sensory system of a human.

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