International Journal of Future Generation Communication and Networking
Vol. 13, No. 3, (2020), pp. 3834–3844

# IOT Based Smart Hands Talk

S.Biruntha, Naga Viknesh M, Naveena K R, Kameshwaran *S*,
*Kaza Ananya, Jothipriya. G*

*AP/CSE,Sri Krishna College of Engineering and Technology, Coimbatore, E-mailbirunthas@skcet.ac.in.*

***Abstract***

*"Kindness is a language the dumb can speak and deaf can hear and understand" According to statistics, the number of deaf and dumb in the world is about 9 billion. It becomes difficult for them to communicate with the normal people. Gesture based communication is the main technique for correspondence for the hard of hearing quiets which utilizes hand signals. This paper aims to provide a device which is easy to use, light weight, cost efficient. This device helps to eliminate the communication gap and tackles the issues of those individuals, who can't learn or unfit to utilize 'gesture based communication' to speak with others by giving them a 'virtual voice'. The smart glove is equipped with flex sensors and for each specific gesture it produces a change in resistance. The data from the sensors is processed using Arduino board which produces voice output through an application.*

***Keywords:*** *Sign language, virtual voice, Smart glove, Sensors, Gesture.*

## I. INTRODUCTION

As per the measurements, the amount of hard of hearing quiets inside the world is concerning 46 billion. It becomes tough for them to speak with the traditional individuals. One amongst the most drawback is that the communication, sign language is that the solely and formal methodology of communication for the deaf mutes that employs hand gestures. The project aims to device a straightforward to use, light-weight weight, value economical good glove to eliminate to communication barrier and solves the problems of these those who cannot learn or square measure unable to use 'sign language' to speak with others by providing them a 'virtual voice'. The good gloves is provided with flex sensors here flex sensors play a significant role, and for every specific gesture it produces a amendment in resistance .The resistance price keeps increasing because the bend will increase .Sensors are enforced into the gloves to sense the finger movement .The data from sensors is processed exploitation Arduino board that produces voice output through associate application. This comes in handy to get rid of the communication gap between the deaf and mute individuals

## II. LITERATURE SURVEY

### A. Tushar Chouhan et al.

Enforced a wired interactive glove, interfaced with a laptop running MATLAB or Octave, a gesture recognition with high accuracy. The glove maps the orientation of the hand and fingers with the help of wind sensors, Hall result sensors and an evaluating instrument. The framework is displayed for the in any case abled segment of the general public to help convert language to an a great deal of human comprehensible kind like issue messages.



ISSN: 2233-7857 IJFGCN

The hardware section of their projected style has its constituent electronic elements as bend device, hall-effect device, measuring instrument and Machine Learning Algorithms Used for Gesture recognition. The bend device outputs square measure fed to the Analog electronic device. The yield of this electronic gadget is given to a current to voltage convertor circuit. Since the voltage yield of the Hall gadget is low, AN electronic gear is required. Gadget yields got square measure given to the inborn ADC for examining the sensors through the qualities, which is moreover utilized for interfacingthe glove with an AI equation. the data securing technique begins with the processor causing the board signs to electronic gadget for getting esteems from the different sensors successive and quickly putting away it in an exhibit. These keep esteems square measure transmitted exploitation general offbeat gathering and transmission (UART) relationship for any procedure and cryptography of the got signals. Though sending the qualities in UART programmed rehash demand (ARQ) subject has been joined for staying away from the information misfortune inferable from transmission blunders.

**B. Wang et al.**

Presented a symbol language recognition system that analysis tensor topological space models a multi-view hand gesture. Language acknowledgment is formed and perceived misuse tensor. At that point, the coordinating strategy is dispensed to detect the information hand motion. The hand recognition method is achieved through colour segmentation. Info picture that is in RGB shading house is reawakened to YCbCr shading house to facilitate the strategy for police work the skin that utilizes the back Propagation (BP) systems model.

**C. KuoChue Neo, et al.**

A lot of hand motions are perceived, that will be that the sign, blessing in an image that caught utilizing a camera. The sign signs are perceived bolstered the finger checks distinguished inside the picture. The Altera's DE2 board that alternatives Cyclone II FPGA chip with Nio's II delicate center processor is utilized to build this technique. FPGA is considered to have the possibility to play out the picture procedure faster accordingly FPGA is utilized to build the framework as. Their methodology depends on the picture procedure strategies to catch the different signs in a few pictures. **D. JanFizza Bukhari et al.**

Proposed a structure including 21 sensors, out of that nine were flex sensors, eleven were contact sensors and one for activity speeding up. at any rate nine Analog voltage channels for flex sensors and at any rate ten electronic channels for contact sensors were required. To overhaul the show and precision of the structure, signal learning for evaluating instrument readings was required. Game plan of activity was set at 9600 and rate at 500 models for consistently. The device used for interfacing signs to enter DAQ contraptions with 68 pin connectors. The sum 28 PXI 8330 module was adjusted



ISSN: 2233-7857 IJFGCN

interface Associate in Nursing external controller to a PXI suspension. It totally was joined with a PCI 8330 in PC with a MXI connect.

It contained a MXI-3 Multi-System Extension Interface for PCI. An overflowing with 26 signs were readied, with twenty records each involving 250 models each. Standard half Analysis was used for arrange and have extraction to diminish property while guaranteeing the most outrageous aggregate class one-sided data as potential.

**E. Vajjarapu Lavanya et al.**

Introduced a structure which may be made abuse unimportant metal strips that zone unit mounted on the 5 fingers of the glove. A copper plate is mounted on the palm as ground. Obvious with their style utilize it's higher to utilize a ground plate as opposed to particular metal strips considering the contact space for ground are a great deal of engaging direct indisputable proof of finger position. The copper strips show a voltage level of premise one in rest position. Regardless after they are open in contact with the base plate, the voltage identified with them is depleted and that they show a voltage level of logic 0, along these lines vital signs a territory unit shaped. Its association based interface that makes it simple to orchestrate with any implanted structure.

**F. Ambika Gujrati et al.**

Proposed a structure that contained flex sensors, material sensors and surveying contraption. Their apparatus needs 5V DC and quickly a transformer of 7800 game-plan (7805) is utilized. Driven's area unit utilized that supports with respect to the transparency being impelled. A

330ω electrical gadget is utilized to drop the voltage and gather it 2-2.5V contrasting by the union rectifier. The redirection of the flex with a base edge of 40°, an obstruction is picked up that is reached out by bowing and voltage is gotten.

Four flex sensors together with their collusion ports zone unit put. The voltage is in mv right now amp (LM358) was acclimated improve it. The action amp utilized could be a non-upsetting kind with high voltage gain. Rf electrical contraption is rheostat with (0kω - 10kω) and RI is a couple of.2kω. A 33k electrical gadget is utilized at the yield of movement amp that shields the voltage from being grounded. PIC16F877 a fringe interface controller is utilized with non-tricky breaking point 8kb bit goals.

The microcontroller changes over the Analog yield into electronic and gives a high voltage. An oscillator with 12MHz is utilized that gives the microcontroller rehash clock beat. 2 33pF capacitors zone unit utilized together with the generator. The high or low voltage is then passed to Associate in Nursing NPN electronic transistor which gives the yield that is any sent to moves. Moves utilized have inside field. One trade goes about as play button and right now elective as forward, for the third flex recognizing part to act the forward hand-off are sent on numerous occasions so attempt and relatively others can work.



ISSN: 2233-7857 IJFGCN

The message is beginning at now sent to voice recorder ISD1720 that has electro-acoustic transducer and speaker related thereto. Electrolytic and mud capacitors area unit utilized that evacuates the waves and drops unsettling influence. Accessory in Nursing RF circuit is utilized that gives changed increment the board which gives predictable yield. The voice is recorded through electro-acoustic transducer and per the flex redirected the yield is gotten from speaker structure. Their circuit format demonstrates the wellbeing to live or decipher seven possibilities stepping B, C, D, F, K and gathering eight.

## III. PROBLEM STATEMENT

Signal based correspondence is the rule specific contraption utilized by practically hard of hearing individuals to present to one another. Regardless, ordinary individuals don't comprehend movement based correspondence and this will make an enormous correspondence impediment between practically hard of hearing individuals and regular individuals. Moreover, the correspondence through movements is besides difficult to learn because of its standard complexities in sentence structure and emphasis. Along these lines, there is a need to build up a structure which can help in causing a comprehension of the sign based correspondence into substance and voice so as to guarantee the plausible correspondence to can be enough occur as of now.

## PRACTICAL IMPLEMENTATION:

The glove needs to be worn on the hand by the disabled and depending on the variation of the movements. It consists hand glove (fitted with Flex sensors), GSM module, RF Transmitter and Arduino Uno, RF Receiver and Arduino Neon as a Controller. RF Receiver receives the command and this command is catch by the Arduino and Arduino controls the actions of this sections. All the gestures created by the hand glove (with Flex sensor) is regenerate into completely totally different messages and commands for the operation of varied devices.



ISSN: 2233-7857 IJFGCN

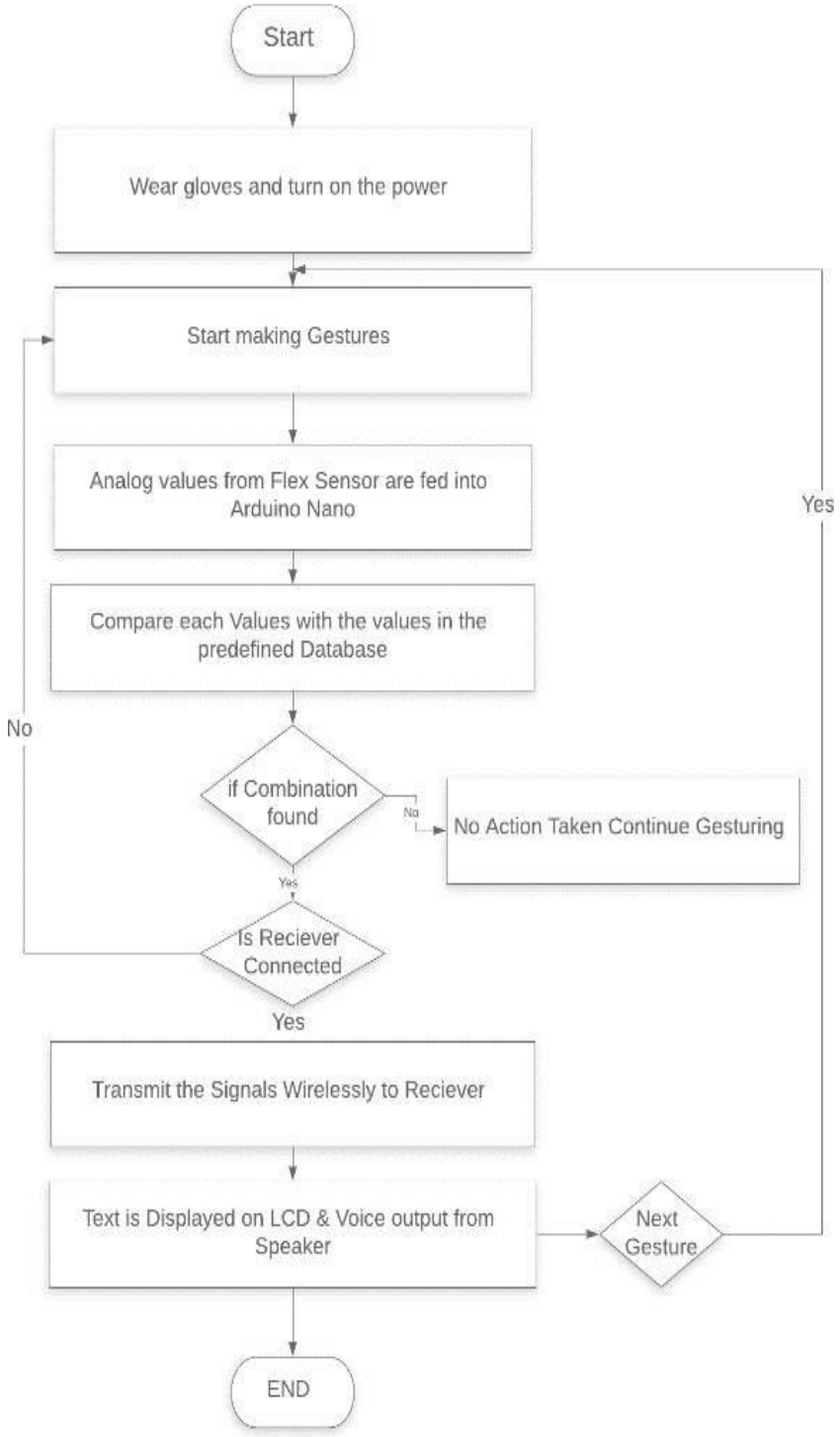


Fig. 1 Flow Chart

Made by this endeavor begins from headway of hand gloves any place the flex sensors district unit caught, furthermore the cost of pioneer changes once its encounters the bowing. The flex locator is another assortment of potentiometer area unit caught to the gloves once we distort the gloves the estimation of the pioneer get changes. The dynamical cost of the locator is relies upon the opposition and applied reason for the twisting once we turn the identifier at some particular edge we can see the estimation of the deterrent is expansion and right now yield get lessened. On the contrary way we can say that it's kind of a correspondingly relative.



ISSN: 2233-7857 IJFGCN

In the wake of overview the dynamical worth of the yield, the estimation of the get recorded by the Arduino and show from the show related thereto. Here the technique begins the Arduino gets totally unique worth from the indicator. The yield worth we can unendingly observe from the alphanumeric presentation that associated there to alphanumeric showcase (16x2) is utilized for the airing the messages or request of the patients at totally better places.

Now just in case, they have water (or medication or something else), all we'd like to try to to is to form a corresponding gesture consequently which gesture would be born-again into text message and sent to the opposite person through the GSM module. Currently victimization the golem app we are able to convert the text messages into voice additionally.

In this project presently we have a tendency to victimization seven gestures because of the matter of the accuracy however we are able to add concerning one hundred and gestures.

presently the device will convert solely few, however betting on the success of this device few a lot of further options perhaps else later onto this communicatory system.

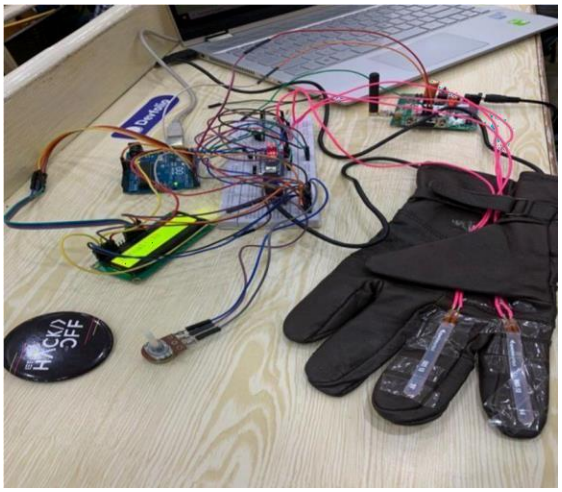

Fig. 2 Implemented prototype

## IV. WORKING PRINCIPLE

Made by this undertaking starts from progress of hand gloves any place the flex sensors square measure caught, and in addition the estimation of contraption changes once its encounters the twisting. The flex gadget is another style of potentiometer square measure fasten to the fingers once we turn the figure the estimation of the gadget get changes. The dynamical worth of the contraption is depend upon the hindrance and applied edge of the twisting once we wind the gadget at some express point we will see the estimation of the obstruction is increase and right now yield get reduced. On the contrary technique we will say that it's kind of a correspondingly relative once the hindrance of the contraption is expansion at that point of yield rot and thusly we will create experience by getting the upside of this method once looking the dynamical estimation of the yield, the estimation of the get recorded by the Arduino and show from the show caught thereto. Here the procedure starts the Arduino gets absolutely unprecedented worth from the device. The yield worth we will ceaselessly see from the alphanumeric grandstand that trapped there to.



ISSN: 2233-7857 IJFGCN

**Mode 0:**

Exactly when structure bounce ON, it stays from the beginning in Mode wherever glove offer remaining concerning customer; his finger identifier cost and position of palm and everybody these get shows up on LCD Screen caught to that. The client will produce very surprising motion and client will alteration Mode by explicit examples as coded. per the programming we've made 3 modes and modes territory unit correction once all the locator offers low yield. Here we tend to attempt to shape the task indicated it will include the 2 entirely unexpected applications. Mode 1:

Right now client will the overseers the house contraptions any place we will when everything is said in done course of action with the most basic a touch of the task. Here the yield of the device is recorded to the Arduino and this expense is empowered with the programming by the Arduino. The Arduino check the worth and made United States out of America the programming and right at present yield we can see from the liquid gem show related with the Arduino. The yield cost is sent to the transmitter for transmit the information. The transmitter is associated with IC HT12E that encodes the information lastly sends from the radio wire. At Receiver finish the information get right with the IC HT12D and send to the hand-off for move reason. The hand-off we will when everything is said in done use just for move reason that utilization to ON or OFF the switch.

## V RESULTS

Fig. 3 The gesture command for food



ISSN: 2233-7857 IJFGCN

Fig. 4 The gesture command for normal



ISSN: 2233-7857 IJFGCN

Fig. 5 The gesture command for water

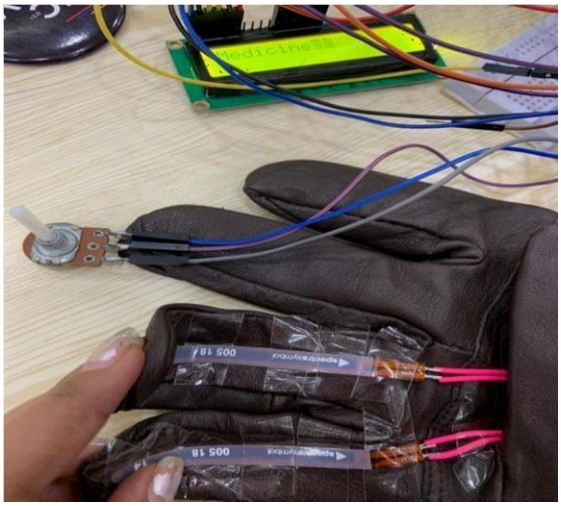

Fig. 6 The gesture command for medicine

Fig. 7 The gesture command for critical



ISSN: 2233-7857 IJFGCN

## V. CONCLUSION AND FUTURE WORK

The primary objective was to create a tool that would scan the signing to assist deaf and dumb individuals to able to communicate additional expeditiously with traditional individuals. Through marking are regularly authorized to talk, the objective individual ought to have an idea of the communication via gestures that isn't potential until the end of time. The glove is fit for deciphering their etymological correspondence signals into discourse in either mechanical man telephone or speaker. The designed glove might assist in bridging communication gap between deaf and dumb folks and traditional population to bound level. This technique can facilitate them in raising their quality of life considerably.

## VI. REFERENCES

[1] Jack Hourcade, Tami Everhart Pilotte, Elizabeth West, and Phil Parette ―A History of Augmentative and Alternative Communication for Individuals with Severe and Profound Disabilities‖ Focus On Autism And Other Developmental Disabilities Volume 19, Number 4, winter 2004.

[2] TusharChouhan, Ankit Panse, Anvesh Kumar Voona and
S. M. Sameer ―Smart Glove With Gesture Recognition Ability For The Hearing And Speech Impaired‖ IEEE Global Humanitarian Technology Conference - South Asia Satellite (GHTC-SAS) September 26-27, 2014.

[3] JanFizza Bukhari, Maryam Rehman, SamanIshtiaq Malik, Awais M. Kamboh and Ahmad Salman ―American Sign Language Translation through Sensory Glove; SignSpeak‖ . International Journal of u- and e- Service, Science and Technology Vol.8, No.1 2015.

[4] VajjarapuLavanya, Akulapravin, M.S., Madhan Mohan
―Hand Gesture Recognition And Voice Conversion System Using Sign Language Transcription System‖ International Journal of Electronics & Communication Technology Volume 5 Issue 4 OctDec 2014.

[5] AmbikaGujrati1, Kartigya Singh, Khushboo, LovikaSoral, Mrs. Ambikapathy ―Hand-talk Gloves with Flex Sensor: A Review‖ International Journal of Engineering Science Invention Volume 2 Issue 4 April. 2013.

[6] M. Mohandes, S. I. Quadri, and M. D. King, ―Arabic Sign Language Recognition an Image Based Approack‖ , in 21st International Conference on Advanced Information Networking and Applications Workshops, 2007 (AINAW‘07), pp. 272-276, 2007.

[7] K. Park, J. H. Kim, and K. S. Hong, ―An Implementation of an FPGABased Embedded Gesture Recognizer using a Data Glove‖ , in Proceedings of the 2nd International Conference on Ubiquitous Information Management and Communication (ICUIMC‘08), 2008.

[8] W. K. Chung, W. Xinyu, and Y. Xu, ―A Real-time Hand Gesture Recognition Based on Haar Wavelet Representation‖ , in Proceedings of the 2008 IEEE International Conference on Robotics and Biomimetics, Washington, DC, USA, pp. 336-341, 2008.



ISSN: 2233-7857 IJFGCN

[9] M. P. Paulraj, S. Yaacob, H. Desa, and W. Majid,
―Gesture Recognition System for KodTangan Bahasa Melayu (KTBM) using Neural Network‖ , in 5th International Colloquium on Signal Processing and Its Applications (CSPA), pp. 19-22, 2009.

[10] S. J. Wang, D. C. Zhang, C. C. Jia, N. Zhang, C. G. Zhou, and L. B. Zhang, ―A Sign Language Recognition Based on Tensor‖ , in Second International Conference on Multimedia and Information Technology (MMIT), pp. 192- 195, 2010. kuochue Neo, HaidiIbrahm and
Wan MohdYusofRahiman Wan Abdul Aziz, ―Development of Sign Signal Translation System Based on Altera‘s FPGA DE2 Board‖ , International Journal of Human Computer Interaction (IJHCI), Vol. 2, Issue 3, pp. 101-114, 2011.

[11] Harmeet Kaur, Amit Saxena, Abhishek Tandon, Keshav Mehrotra and Khushboo Kashyap, ―A Review Paper on Evolution of Smart Glove‖ , International Journal of Scientific Research and Management Studies (IJSRMS), Vol. 3, Issue 3, pp. 124-128, 2016.

[12] Abhishek Tandon, Amit Saxena Keshav Mehrotra, Khushboo Kashyap, Harmeet Kaur, ―A Review Paper on Smart Glove – Converts Indian Sign Language (ISL) into Text and Speech‖ , International Journal for Scientific Research & Development (IJSRD) Vol. 4, Issue 08, pp. 269-272, 2016.

[13] Voice Manipulation Tool for System Automation Using Artificial Intelligence (Personal Assistant), J. Boopala, Journal of Adv Research in Dynamical & Control Systems, Vol. 10, 12Special Issue, 2018, ISSN 1943-023X.

[14] Android Solicitation Hinge Automated Wheel Chair for Physically Crippled Persons, J. Boopala, S. Biruntha, S. Senthil Prasath and K. Senathipathi, Indian Journal of Science and Technology, Vol 12(8), DOI: 10.17485/ijst/2019/v12i8/141805, February 2019, ISSN (Print) : 09746846, 1 ISSN (Online) : 0974-5645.



ISSN: 2233-7857 IJFGCN