

A Wireless Scheme to Establish a Communication between One Disable with Multiple Disables: *Result analysis*

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Abstract - *This topic presents the improvement of a sensory data glove using Context Switch as finger-bend measurement. These context switches are very flexible to use or to do the finger movement easily. Here the RF sensor is used for analyzing the wireless signal. This sensor is used for transmitting and receiving purpose. This glove provides a lofty capability for the disable person which is unable to communicate with normal ones. Here, it uses the digital format for generating the output. To make the glove simple to use, a four-stage calibration process conjointly with the creation of the calibration device is comprehended. It uses binary pulse code generation for the synthesized speech recognition. In order to accelerate the process of training, it proposes a finger movement method. So far, the experimental results of this method are extremely satisfactory and high precision.*

Index Terms - *Gesture Recognition, Hand Glove, RF sensor, Context Switch, Arduino Uno and Speaker.*

I. INTRODUCTION

In this days there are no any system that can help for the disable peoples .There are so many visually weakened people about 285 million in the world. These persons use sign language to communicate with other people. But it's very hard to use and know this sign language because it comprises approximately 6000 gestures [1].

Sign language is the almost used by everyone when the conduction of audio is nearly unworkable or outlawed, or when the action of typing and writing is grim, but the probability of revelation exists. Furthermore, sign language is the communicative approach and natural language for the hearing impaired. Since the time when sign language is gestured efficiently and interactively like complementary enunciated languages, a sign language identifier must be able to ascertain uninterrupted sign lexes in real-time.

Distinct type of sensors known as 'flex-sensors' are embed into a hand glove in order to triumph the goal. In this exploration a prototype of a judiciously priced and technically advanced wheelchair is to be planned and developed. This is to support the communication of severely disabled persons and enhance the manoeuvring of the vehicle with the use of hand movements. The proposed pattern will be interactive wirelessly between the hand glove control and controller [2]. This model uses 26 gestures of hand to transfer alphabets and 10 more gestures to transfer numbers.

II. PROPOSED SYSTEM

The key input of the system would be the alignment and posture of the hand. The proposed system focuses on break point of finger. Upon obtaining this data is encoded and transferred wirelessly to a computer device. The computer device would alter this position into a text message and voice message [2]. The glove with IR sensors transfers the data to RF transmitter which transfers it to RF receiver module to transfer wirelessly. The transferred data is acknowledged by computer and converted to text and

speech. The system intended at building a low cost solution. The major limitation was the cost of commercially available flex sensors. Hence the system use IR transmitter and receiver to accept the signals of a finger break point. The cost of commercially accessible flex sensor is \$10 per sensor, where the IR and RF sensors are more precise, easy to recognize and cost effective.

The Ardiuno Uno is a microcontroller board built on the ATmega328 (datasheet). It consist of 14 digital input/output pins, a USB connection, a reset button, an ICSP header, a power jack and 16 MHz ceramic resonator,. It incorporatethe whole thingessential to support the microcontroller; basicallyattach it to a computer using a USB cable or power it usinga AC-to-DC adapter or battery to get started.

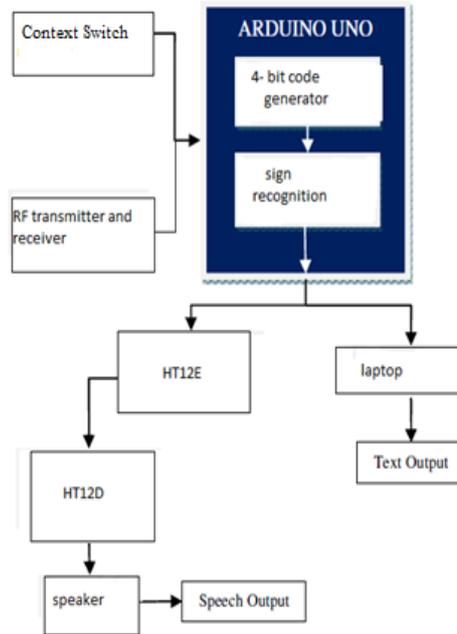


Figure -1: Architecture of Data glove

Here the sensors are used namely IR and RF. These sensors are used for the transmitting and receiving purpose. This glove provides a high facility for the disable persons which are not capable to communicate with normal people. Here, this glove uses the digital format for generating the output. To make the glove easy for usage, a four-stage calibration processcomposed with the construction of the calibration device is apprehended. It uses the binary pulse code generation for the recognition of synthesized speech. In order to speed up the training procedure, it intends a “Make and Break” method.

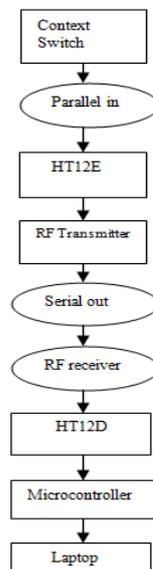


Figure -2: Flow of proposed system

Proposed system contains Arduino board and computer/laptop at receiver side. One transmitter is also present at receiver side which is connected to Arduino board. This Arduino board is connected to laptop through USB. In proposed system, a switch case algorithm is used to display an output using VB.net. So far, the experimental outcomes of this technique are very satisfactory and high precision.

2.1 Encoder

An **encoder** is a device, transducer, software program, circuit, person or an algorithm that translates data from one form to another, for the purposes of calibration, speediness or compressions. Here the encoder is sensing the input from the context switch as the movement of finger. The working of context switch is highly accurate as compared to the flex, tilt and other developed component. The finger movement is to be sensed by the encoder IC i.e. HT12E which translates that signal to the RF transmitter.

In the system the encoder works on the external battery supply which is given through the cells or through an adapter.

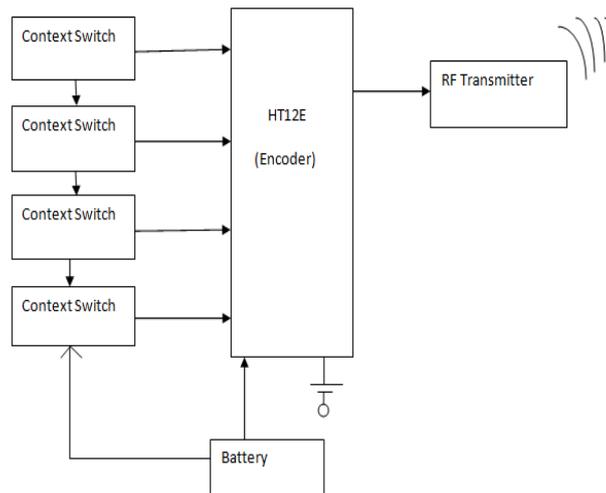


Figure -3: Block diagram of Encoder

HT12E is a circuit of 2^{12} series of encoders and which is an encoder integrated. They are combined with 2^{12} series of decoders for usage in applications of remote control system. It is essentially used in interfacing infrared circuits and RF. The selected duos of encoder/decoder should have similar number of addresses and data format.

HT12E transfigures the parallel inputs into serial output. It encodes the 12-bit parallel data into serial for communication through an RF transmitter. These 12 bits are alienated into 8 address bits and 4 data bits.

HT12E has a transmission enable pin which is active low. When a trigger signal is acknowledged on TE pin, the preset addresses/data are transferred/collected with the header bits through an RF or an infrared communication medium. HT12E initiates a 4-word conduction cycle upon receiving of a transmission enable. This cycle is reiterated as long as TE is kept low. The moment TE returns to high, the encoder output finalizes its final cycle and then halts.

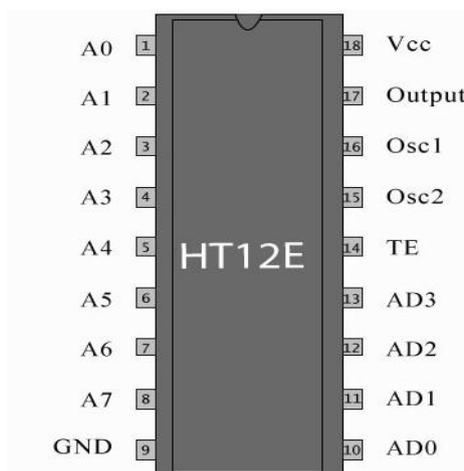


Figure -4: Pin Diagram of Encoder

| Pin No | Function | Name |
|--------|-----------------------------------|--------|
| 1 | 8 bit Address pins for input | A0 |
| 2 | | A1 |
| 3 | | A2 |
| 4 | | A3 |
| 5 | | A4 |
| 6 | | A5 |
| 7 | | A6 |
| 8 | | A7 |
| 9 | Ground (0V) | Ground |
| 10 | 4 bit Data/Address pins for input | AD0 |
| 11 | | AD1 |
| 12 | | AD2 |
| 13 | | AD3 |
| 14 | Transmission enable; active low | TE |
| 15 | Oscillator input | Osc2 |
| 16 | Oscillator output | Osc1 |
| 17 | Serial data output | Output |
| 18 | Supply voltage; 5V (2.4V-12V) | Vcc |

Table -1: Pin Description of Encoder IC

2.2 Decoder

A decoder is a circuit that vicissitudes a code into a set of signals. It is named as a decoder because it does the contrary of encoding, but the study of encoders and decoders will start with decoders because they are easier to design. **HT12D** is a **decoder integrated circuit** which belongs to 2^{12} series of decoders. This sequence of decoders is predominantly used for remote control system applications, like security system, car door controller, burglar alarm etc. It is essentially provided to interface infrared circuits and RF. They are combined with 2^{12} series of encoders. The elected duos of encoder/decoder should have equivalent number of addresses and data format.

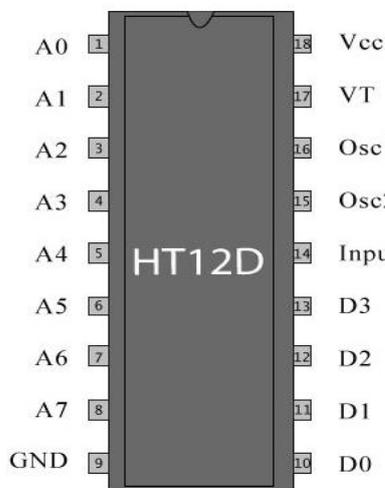


Figure -5: Pin Diagram of Decoder

Simply, HT12D transfigures the serial input into parallel outputs. HT12D decodes the serial addresses and data acknowledged by an RF receiver, into parallel data and drives them to output data pins. The serial input data is matched with the local addresses three times incessantly. The input data code is deciphered when no error or supreme codes are found. A valid

conduction is indicated by a high signal at VT pin. HT12D is proficient of decoding 12 bits, out of which 8 are address bits and 4 are data bits. The data on 4 bit latch type output pins keep on unaffected till new is acknowledged.

| Pin No | Function | Name |
|--------|------------------------------------|--------|
| 1 | 8 bit Address pins for input | A0 |
| 2 | | A1 |
| 3 | | A2 |
| 4 | | A3 |
| 5 | | A4 |
| 6 | | A5 |
| 7 | | A6 |
| 8 | | A7 |
| 9 | Ground (0V) | Ground |
| 10 | 4 bit Data/Address pins for output | D0 |
| 11 | | D1 |
| 12 | | D2 |
| 13 | | D3 |
| 14 | Serial data input | Input |
| 15 | Oscillator output | Osc2 |
| 16 | Oscillator input | Osc1 |
| 17 | Valid transmission; active high | VT |
| 18 | Supply voltage; 5V (2.4V-12V) | Vcc |

Table-2: Pin Description of Decode

III. RESULT ANALYSYS

In this section the analysis is going on the basis of developed project. It shows the final result generation on the basis of binary inputs.

The database is stored with the messages in to the coding part. This shows only the 4bit data and its generated 16 binary combinations with the particular messages. Here the binary input is get match with the storage data and then only the respected result is generated.

| Sr.No | Finger 1 | Finger 2 | Finger 3 | Finger 4 | Result Set |
|-------|----------|----------|----------|----------|---|
| 1 | 0 | 0 | 0 | 0 | Send message on mobile at remote location |
| 2 | 0 | 0 | 0 | 1 | Very good! I am very happy |
| 3 | 0 | 0 | 1 | 0 | I am eagerly waiting for this movie |
| 4 | 0 | 0 | 1 | 1 | I want water please |
| 5 | 0 | 1 | 0 | 0 | What was u trying to say? I did not get it. |
| 6 | 0 | 1 | 0 | 1 | Something is going wrong |
| 7 | 0 | 1 | 1 | 0 | OH God...!!!! |
| 8 | 0 | 1 | 1 | 1 | Sorry...!can't here, please speak loudly |
| 9 | 1 | 0 | 0 | 0 | Thank you..! |
| 10 | 1 | 0 | 0 | 1 | Welcome... |
| 11 | 1 | 0 | 1 | 0 | I need doctor |
| 12 | 1 | 0 | 1 | 1 | Is this the right way |
| 13 | 1 | 1 | 0 | 0 | I want to go in market |
| 14 | 1 | 1 | 0 | 1 | I am feeling better now |
| 15 | 1 | 1 | 1 | 0 | Not Well...! |
| 16 | 1 | 1 | 1 | 1 | Initial state |

Table-4: Generated Result

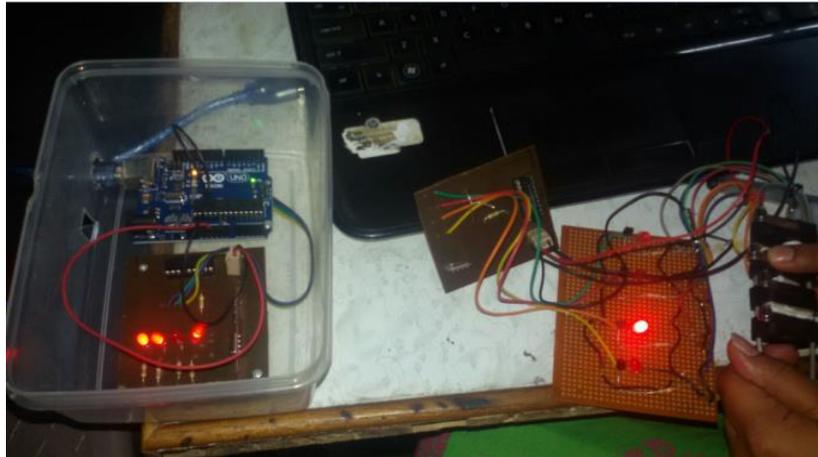
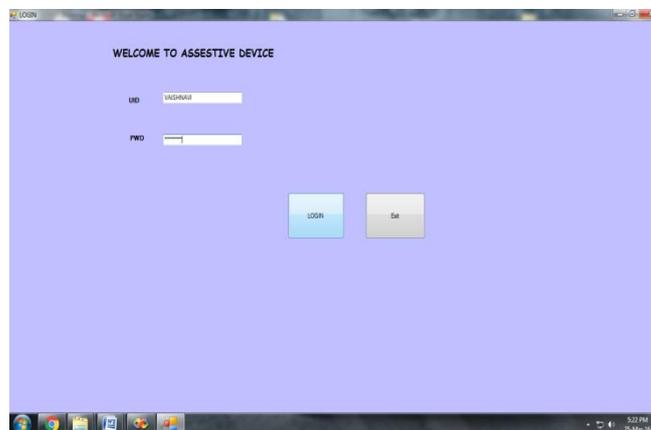


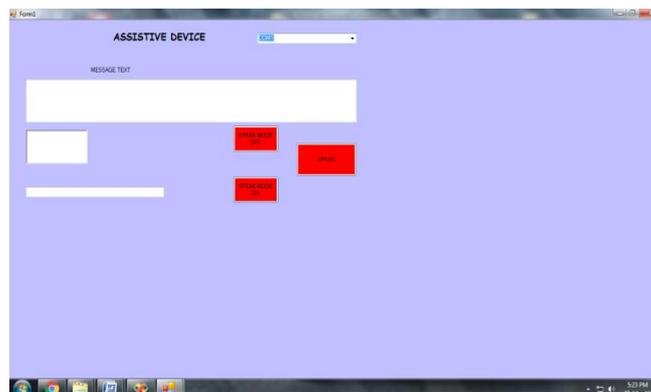
Figure -6: Designed of Data glove

In this image its shows the whole system of data glove. In it encoded or decoded part is shown. It uses for totransmit orreceives the data via RF transmitter /receiver. Then the laptop connectivity is shown via USB port for to print the message or to read that message in a loud way.



Form -1: Log-In Screen

This form is for the security purpose. It only accepts the correct user and the password should be matched with that login user then and only then it proceed otherwise it get in to the EXIT mode.



Form -2: Output Screen

This is the last display screen which is gives the message in to prints as well as the loud way. It also shows the input that is forwarded from the user in the form of 4 bit binary combination. Then the input is matched and then respected result is generated.

CONCLUSION

The proposed system gives a framework for building the fingerspelling gesture recognition model depends on the data assimilated from a wireless sensor glove. The glove contains 4 IR sensors providing a degree of finger bending, as well as gesture and positioning of the hand based on the framework. Pangram designates that the model with rules for precision augmentation outperforms the original multivariate Gaussian model. A straightforward technique for additional improving of the recognition precision is to compare each detected word against a close vocabulary set. Any people who cannot listen, they can also use this prototype.

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