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Electronic Hand Glove Through Gestures For Verbally Challenged Persons

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ABSTRACT
This paper presents design of Electronic hand glove to facilitate an easy and better communication through synthesized speech for the verbally challenged peoples. Most Probably, a speechless person communicates through sign language which is not understood by the majority of people. The proposed system is designed to solve this problem. Gestures of fingers of a person of this glove will be converted into synthesized speech to convey an audible message to others. Speech is typically accompanied by manual gestures. Earlier there were many systems designed for dumb and deaf to interact with ordinary people. But these systems had many drawbacks and interrupts. We are designing such a system that even a dumb, deaf and blind can communicate with each other without taking help of ordinary people. This system is going to help them to interact with the outside world.
*Keywords***:** Hand glove, speechless communication, gesture, ATMEGA 328

I. INTRODUCTION

In recent years, there is tremendous increase in verbally challenged and speechless How visible are they in offices or behind shop counters? The truth is that there is often little room for these people in the workplaces. In recent years, researchers have been focusing on hand gestures detections and been popular for developing applications in the field of robotics and extended in the area of artificial or prosthetic hands that can mimic the behavior of a natural human hand.[3]

Dumb people cannot interact with other persons in their surroundings. They even face many problems in their day to day life. Hence we are designing a system which will minimize their problems. Glove talk is a system which translates hand gestures into speech. Hand gestures are mapped continuously by using IR sensors. The mapping allows the hand to act as an artificial vocal track that produces speech in real time.

Idea behind the development of this system is at first to speak for the speechless people in order to fulfill their basic needs thereby to make them independent self-reliable. The developed assistive aid produces voice which is audible to the care takers so that they can react for the voice message.

II. LITERATURE SURVEY

The need for inventing a system such as electronic hand glove has made the impaired people to live their life comfortably with us. This system helps to minimize the distance between us and them.

Electronic Hand Glove is a portable device which can be easily carried anywhere. Just by the finger movements we can predict what the person want to convey his message. This will help the care taker to know what the patient wants.

In [1], author presented design and implementation of Talking hand glove for the hearing impaired. Advantage of this system is hearing impaired people generally use hand sign language to communicate. The main idea of project is talk able to translate this sign language into speech.

In [2], authors presented implementation of electronic speaking glove for speechless patients a tongue to a dumb. The proposed system is designed to facilitate an easy communication through synthesized speech for the benefit of speechless patients.

In [3], authors described design of speaking gloves for speechless persons. The main aim of the paper is to develop electronic speaking glove which is designed to facilitate an easy communication through synthesized speech for the benefit of speech- less patients. A speechless person communicate through sign language which is not understood by the majority of people. The proposed system is designed to solve the problem.

III. METHODOLOGY

Researchers have been focusing on hand gesture detection and been popular for developing in the field of robotics. Electronic Hand Glove is a portable device which can be easily carried anywhere. It is extended in the area of artificial hand.

The need for inventing a system such as electronic hand glove has made the impaired people to live their life comfortably with us. Just by the finger movements we can predict what the person want to convey his message.

In proposed system we have given contact switches for this purpose. We have provided a voice call accessing an internet too. This will help the care taker to know what the patient wants. The gestures through fingers are converted into audio signal so that the blind person can here it and communicate.
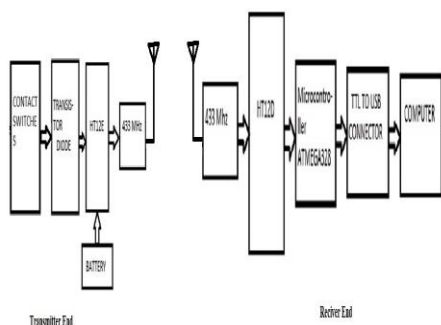

Fig. 1 Block diagram

IV. HARDWARE SPECIFICATION

The proposed system consists of HT12E encoder, HT12D decoder, AVR-8 bit micro-controller, crystal oscillator and battery. The hardware specifications are mentioned below.

* **HT12E Encoder**

Operating voltage : 2.4V-12V.
Low power and high noise immunity CMOS technology.
Low standby current:0.1 A(typ.) at Vdd=5v.
Minimum transmission word : Four words.

* **HT12D decoder**

Operating voltage : 2.4V 12V
Low power and high noise immunity CMOS technology
Low standby current
Capable of decoding 12 bits of information
Binary address setting
Received codes are checked 3 times
Address/Data number combination - 8 address bits and 4 data bits

* **ATMEGA 328**

High Performance, Low Power AVR 8-Bit Microcontroller.
High Endurance Non-volatile Memory Segments.
Operating Voltage : { 1.8 - 5.5V
Temperature Range : -40°C to 85°C

* **BC547 transistors**

High voltage : 65V

Low noise

* **Crystal oscillator**

Frequency range : 16MhZ

* **Battery**

Operating Voltage : 3V-5V

* **Transmitter Section**

Contact Switches

When we move down our finger, the switch is pressed. Due to this, the own path is completed. The pulse is sent to the base of BC547 Transistor IC.

Transistors

When the pulse is received at the base of transistor, the high or low pulse is transmitted. Relation of input which we get at the base and the output of transistor is inverted.

HT12 Encoder

They are capable of encoding information which consists of N address bits and 12-N data bits. Each address/ data input can be set to one of the two logic states. The programmed addresses/data are transmitted together with the header bits.

433 MHz transceiver

The Transmitter, Receiver and Transceiver all have 9600 baud serial interfaces and stand-alone, 3 function switch inputs and outputs. The modules can communicate over distances up to 250 feet. The boards operate on +5V
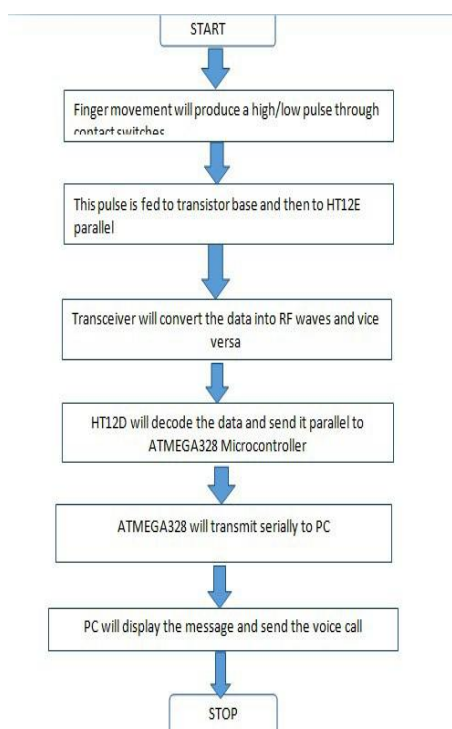
* **Receiver Section**

HT12 Decoder

The decoders receive serial addresses and data from a programmed 212 series of encoders that are transmitted by a carrier using an RF transmission medium. They compare the serial input data three times continuously with their local addresses. If no error or unmatched codes are found, the input data codes are decoded and then transferred to the output pins.

* **ATMEGA328 Micro-controller**

It collects information from wireless hand glove in serial manner and generates a bit pattern of 0101 combination which is later on serially printed through laptop by transmission pin of microcontroller itself.

V. FLOWCHART

The flowchart of working of proposed system is shown below.

START

Finger movement will produce a high/low pulse through contact switches

This pulse is fed to transistor base and then to HT12E parallel

Transceiver will convert the data into RF waves and vice versa

HT12D will decode the data and send it parallel to ATMEGA328 Microcontroller

ATMEGA328 will transmit serially to PC

PC will display the message and send the voice call

STOP

VI.   ADVANTAGES
• Cost effective
• Easy to implement
• Useful for handling emergency conditioning
• Immediate alert is possible
• Portable: The handicapped person can carry the glove easily wherever he wants to.
• Reliable
• Fast communication in emergency.
• The care taker will be always in contact with handicapped person.

VII.   APPLICATIONS
• Easy communication for handicapped people with the normal people.
• The care taker will be always in contact with handicapped person.
• Useful for speech Impaired and paralyzed person.

VIII.   CONCLUSION
The proposed system is the useful tool for speech impaired and partially paralyzed patients which fill the communication gap between patients, doctors and relatives.

It will give dumb a voice to speak for their needs and to express their gestures.

As it is portable, it requires low power operating on a single rechargeable battery and having less weight.

ACKNOWLEDGEMENTS

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