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Smart Hand Glove for Disabled and Bedridden Patients

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ABSTRACT: Smart Hand Gloves help confined to bed and handicapped individuals to live with typical individuals. The glove is used to perceive the hand gestures and convert it to discourse which can be worked out through the speakers. This additionally help ordinary individual to get what he/she is attempting to say and act likewise. This Smart Gloves has control of Home Appliance from which truly weakened individual become free to live. The hand gloves comprise of heartbeat sensor that screens the variations in beat rate and cautions when beats rate becomes unusual. this glove also tracks the temperature and also consist of sweat sensor. The principle objective of the carried out project is to create a solid, simple to utilize, light weight smart hand gloves framework which can limits the impediments for debilitate individuals where they can remain with the race.

KEYWORDS: discourse, sweat sensor, debilitate, heart beat sensor, pulsesensor, home automation.

I. INTRODUCTION

Assistive technology, it is an umbrella term which includes rehabilitative and adaptive devices for people with disabilities and also includes the process used in locating and using them. It promotes independence by enabling differentially abled persons to perform tasks that they were formerly unable to accomplish, or had great difficulty in accomplishing, by providing various methods for interacting with the innovative technology needed to accomplish such tasks. It points to any piece of equipment, or product system, which is acquired commercialization, modification, or customization and this is used to maintain, or improve functional capabilities of differentially abled individuals.

Indian Census in 2016 estimated that over 26 million people suffer from some kind of disability that is equivalent to 2.21% of the total population. The most common types of disabilities are disability in movement (that accounts to 20.9%), hearing impairment (19.5%), and speech impairment (7.68%). People with speech impairment use sign language to communicate with the society. The conventional idea for gesture recognition is to use a camera-based system to track the hand gestures. The camera-based system is comparatively less user friendly as it would be difficult to carry around. In addition, it would not be feasible to use it in crowded areas as it would pick up multiple gestures from different people who are in its viewing angle. Separation of such unwanted gestures is tedious and not a viable solution.

This project discusses the novel concept of glove-based system promises to be more portable. The glove is used to recognize the gesture and convert it to speech which can be played out through the speakers. This smart glove has the facility to control home appliances from hand gestures of a physically impaired person to become an independent. it also comprise of heartbeat sensor that screens the variations in beat rate and cautions when beats rate becomes unusual. this glove also tracks the temperature and also consist of sweat sensor.

II. RELATED WORK

Automated Sign Language Interpreter Taking huge leaps in technologies with each passing year, the humans are making smart inventions every year to help themselves and for the ones who are affected by any disability. The project aims to make the communication for dumb people easy and hence proposing a sign interpreter, which automatically converts sign language into audio output. For the dumb people, sign language is the only way of communication. With the help of sign language, physically impaired people express their thoughts to the other people. It is difficult for

common people to understand the specific sign language therefore communication becomes difficult. The sign language recognition has become an empirical task, as it consists of various movements and gesture of the hands and therefore getting the right accuracy at a low-cost is a mammoth task. Instrumented gloves with audio out are the solution to this problem. The gloves attached with various sensors are worn for sign interpretation. Hence, the proposed system

solves the problem and helps the dumb people in communication with the rest of the world at low cost.

└ Smart gloves for hand gesture recognition: Sign language to speech conversion system The idea proposed in this paper is a smart glove which can convert sign language to speech output. The glove is embedded with flex sensors and an Inertial Measurement Unit (IMU) to recognize the gesture. A novel method of State Estimation has been developed to track the motion of hand in three dimensional spaces. The prototype was tested for its feasibility in converting Indian Sign Language to voice output. Though the glove is intended for sign language to speech conversion, it is a multipurpose glove and finds its applications in gaming, robotics and medical field.

└ Smart glove for Sign Language communications Human beings have a natural ability to see, listen and interact with their external environment. Unfortunately, there are some people who are differently abled and do not have the ability to use their senses to the best extent possible. Such people depend on other means of communication like sign language. This presents a major roadblock for people in the deaf and dumb communities when they try to engage in interaction with others, especially in their educational, social and professional environments. Therefore, it is necessary to have an advance gesture recognition or sign language detection system to bridge this communication gap. Here an effort has been made to develop a smart glove using Intel Galileo Gen 2 IoT kit for real-time gesture recognition. The objective is to create a device which helps the hearing or speech impaired persons to communicate with others.

└ Smart glove with gesture recognition ability for the hearing and speech impaired The primary goal of this paper is to design and implement a low cost wired interactive glove, interfaced with a computer running MATLAB or Octave, with a high degree of accuracy for gesture recognition. The glove maps the orientation of the hand and fingers with the help of bend sensors, Hall Effect sensors and an accelerometer. The data is then transmitted to a computer using automatic repeat request (ARQ) as an error controlling scheme. The system is modeled for the differently abled section of the society to help convert sign language to a more human understandable form such as textual messages.

III. METHODOLOGY

The work of this project start from movement of hand gloves where the flex sensors are attached, and the value of sensor changes when its experiences the bending. The flex sensor is another type of potentiometer are attach to the fingers when we bend the figure the value of the sensor get changes. The changing value of the sensor is depend upon the resistance and applied angle of the bending when we bend the sensor at some particular angle we can see the value of the resistance is increase and accordingly the output get reduced. On the other way we can say that it's like a inversely proportional when the resistance of the sensor is increase at that instant the value of output decrease and accordingly we can make project by getting the advantage of this process.

Mode 1

In this Mode, user can use feature of Voice and Playback by generating desired gestures then recorded voice can be played. When the mode gets activated, the sensor gives some value to the Arduino and according to the programming the signal passes from the Arduino to the voice and playback recorder (APR33A3). The recorder check which port or section is active at that time and sound which already recorded in the recorder it play. The sound we hear from the speaker which attached to the recorder.

The Pulse sensor present in the hand glove will continuously monitor the pulse rate of patient and display it in the LCD display.

Mode 2

In this mode a user can control the home appliances where we deal with the major part of the project. Here the output of the sensor is recorded to the Arduino and this value is matched with the programming by the Arduino. The Arduino check the value and matched us the programming and the output we can see from the LCD attached to the Arduino. As well as the home appliances can be controlled by the patient himself using gestures.

IV. EXPERIMENTAL RESULTS

Different hand developments are prerecorded according to patient necessities and each development is connected with explicit capacities. Close by glove thumb finger goes about as mode controller which can change modes among discourse and home computerization mode. In discourse mode ,nonstop heartbeat is been checked utilising beat sensor set. In this glove, 4 prerecorded guidelines has been remembered for discourse mode. While in robotization mode, client can handle home appliances.

Flex Sensor assumes the significant part. The glove is fitted with flex sensors along the length of each finger and the thumb. The flex sensors give yield as voltage variety that fluctuates with level of curve. This flex sensor yield is given to the ADC channels of microcontroller. It measures the signs and perform simple to advanced sign transformation. Further the handled information is sent in a remote way to the recipient area. In this segment the signal is perceived also, all the while a discourse yield is play sponsored through speaker. Home mechanization framework is additionally controlled utilizing these signals. Pulse sensor is included in the hand glove which continuously monitor the pulse variation in patients and alarms in abnormal conditions.

This paper introduced the Smart Hand Gloves for Disable People. It will provide the more reliable, efficient, easy to use and light weight solution to user as compare to other proposed papers. This will responsible to create meaning to lives of Disable People.

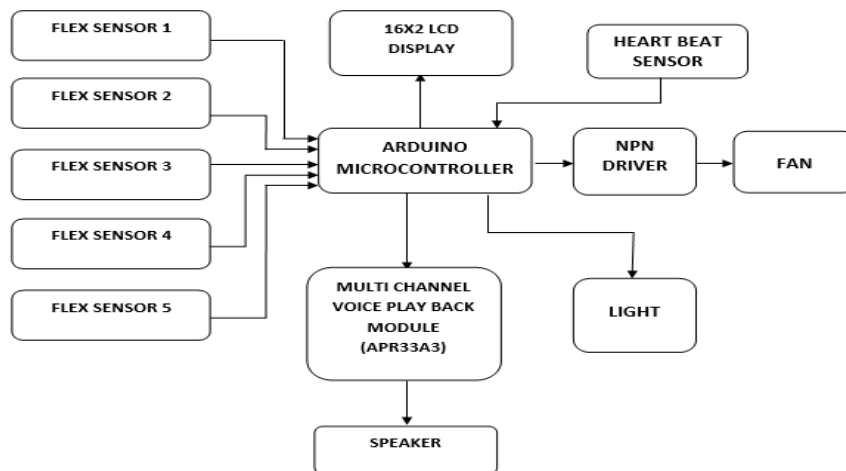


Fig. 1: block diagram

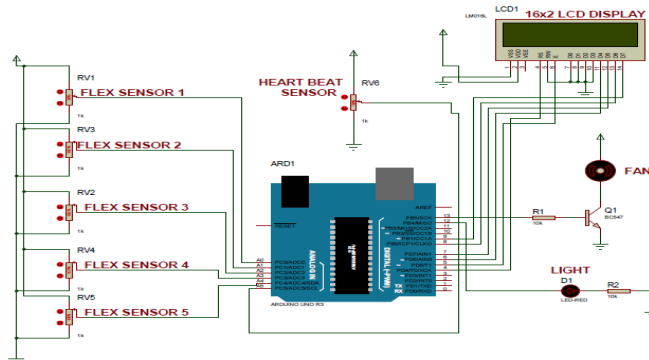


Fig.2:circuit diagram

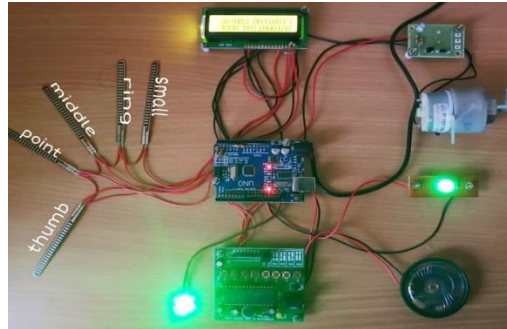


Fig. 3 model of smart hand glove








INPUT		OUTPUT
Thumb Finger		Mode changes from speech to automation and vice versa
SPEECH MODE		
Point Finger		I'm Thirsty
Middle Finger		I'm Hungry
Ring Finger		I need Medicine
Small Finger		Take me out side
HOME AUTOMATION		
Point Finger		Work as ON/OFF switch for light
Middle Finger		Work as ON/OFF switch for fan

Fig4:working

V. CONCLUSION

This paper introduced the Smart Hand Gloves for Disable People. It will provide the more reliable, efficient, easy to use and light weight solution to user as compare to other proposed papers. This will responsible to create meaning to lives of Disable People.

This paper presented the Smart Hand Gloves for incapacitate People. It will give the more solid, productive, simple to utilize and light weight answer for client as contrast with other proposed papers. This will dependable to make significance to lives of incapacitate People. With the assistance of various motions orders, distinctive different orders can be added. For more dependable and low intricacy of the circuit microcontroller can be supplanted by the Arduino or other Advanced Microcontrollers. In this task many sorts of different applications can be added with utilizing the diverse sort of sensors like Heartbeat sensors for heartbeat checking also, Temperature sensor for internal heat level checking. Utilizing the Xbee Module we can make a remote zone and this gadget may speak with different gadgets too. Utilizing the IOT innovation we can associate this for live updates of the patient or individual like areas, status body conditions.



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