EMERGENCY ALERT SYSTEM FOR DISABLED PEOPLE USING HAND GESTURES AND GSM

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Abstract: Now a days we are facing many problems to communicate with disabled people because normal peoples are not trained with hand gestures. There are almost 30% of disabled people in the world. So it's very difficult to communicate with normal people. So to overcome these problems speaking systems were implemented but they are having some drawbacks. They were implemented a hand glove with inbuilt flex sensor and the movement of hand gesture will be captured and it will be compared with previously stored information. But by using this there is a problem i.e., because of using a flex sensor multiple times the density of the flex will be decreases. Hence we will be getting some errors and the output may not be accurate. So we are implementing a new model using MEMS sensor the output of the people will be given to the MEMS and the content will be compared with voice module which is previously recorded and the output will be displayed in LCD and also in the speaker. And GSM module is interfaced for emergency purpose by using push button. If we operate the push button then the message will be sent to the previous recorded numbers saying that they are in some need. So the alert will be given to that particular person and buzzer will be on.

1. INTRODUCTION:

Having difficulties like being visually impaired, hard of hearing, disabled are a greater amount of concern. As indicated by the World Health Organization, around 285 million individuals on the planet are visually impaired, 300 million are hard of hearing and 1 million are mute and 9.1 billion peoples are disabled. In everyday life communication is a serious issue for the disabled people. It's very difficult for the disabled people to convey their message to regular people. Since regular people are not trained on hand sign language, the communication becomes very difficult. In emergency or other times when a disabled people among new people communication with nearby people or conveying a message becomes very difficult.

The gestures created by the disabled person are difficult to understand. Sign language is a language which is used for communication between the normal people and disabled people. Sign language relies on sign patterns, i.e., body language, orientation and movements of the arm to facilitate understanding between people. In their day to day life they faced lot of problems on their communication. This paper is described to reduce the communication gap between the normal people and disabled people. The sign language is based on the hand gestures. Gesture is defined as an expressive movement of body parts. The collection of data can be stored on the controller. The data processing unit is used to perform the controlling and transferring function.

Two MEMS sensors are used in this paper, it generate eight outputs. By operating one MEMS sensor will get a basic needs i.e. food, medicine, water, etc. as output through speaker. The other MEMS sensor is used to operate light and fan and the output will be displayed in LCD. For the emergency purpose we are using push button and GSM module. If in case of any emergency situation by operating a pushbutton buzzer and GSM will be activated. By using GSM, SMS will be send to the particular person.

II. LITERATURE SURVEY

In this research of designing a system that will help disabled people to communicate in our surroundings. This research proposal is based on a very simple concept whereby we need to have a means for capturing the sign languages available in order to utilize International Journal of Engineering Research And Advanced Technology, Vol.5, Issue 8, August-2019 www.ijerat.com Page 27 DOI: 10.31695/IJERAT.2019.3491 them to solve the presented problem above, meaning using to translate them into speech so that voice impaired people can communicate. As a precursor to this research there have been many research involving simply of communication to disabled people. For example, in the research of Sign language, a language through which communication is possible without the means of acoustic sounds. Also is an effective tool that allows disabled people to communicate with their non-mute counterpart. However, hand gestures are still not the most natural mode of communication and unmute people still find it difficult to adapt to audio-less communication [1].

As well as in the research of electronic voice to disabled people using flex sensor, a system facilitates individuals by means of a glove based mostly disabled communication interpreter system. The glove is internally equipped with four flex sensors. For every specific gesture, the flex detector produces a proportional amendment in resistance and measures the orientation of hand. The process of those hand gestures is finished in controller. The glove includes 2 modes of operation- coaching mode to learn of each user associate degree an operational mode. The concatenation of letters to create words is additionally drained controller.

Additionally, the system conjointly includes a Text to Speech conversion (TTS) block that interprets the matched gestures i.e. text to voice output [2].

Also in the research of image processing based speaking system for disabled people using hand gestures, a system which would enable the disabled people to communicate with each and every one. In this system a webcam is placed in front of the physically impaired person. The physically impaired person would put his finger in front of the web camera and the webcam will capture the hand gesture and perform image processing using principle component analysis algorithm (PCA). The co-ordinates captured will be mapped with the one previously stored and accordingly exact picture from the database will be identified. Continuing in this way physically impaired person will be able to go through the entire sentence that he wants to communicate. Later on this sentence will be translated into speech so that it would be audible to everyone [3]. As well as in the research of Detection of Finger Motion using Flex Sensor for Assisting Speech Impaired, this paper is mainly focused on aiding the patients. Our work helps in improving the communication with the disabled using flex sensor technology.

A system is developed that can translate different signs including Indian sign language to corresponding text. About 9 billion people in the world come into this category which is quite large number to be ignored. Flex sensors placed on hand gloves pick up gestures and translate that to text data with the help of Analog to Digital convertor and microcontrollers. The main aim of the system is to develop a cheap glove that disabled people can use for communication. When the gesture of an alphabet is made respective alphabet is shown in the LCD. Sign language is prevalent amongst the disabled individuals. With the conventional sign language not acknowledged to the signers, it affects their interpersonal relationships in the society in an adverse manner. A sophisticated method is required as disabled people use sign language for their communication which is difficult to understand by the normal people [4]
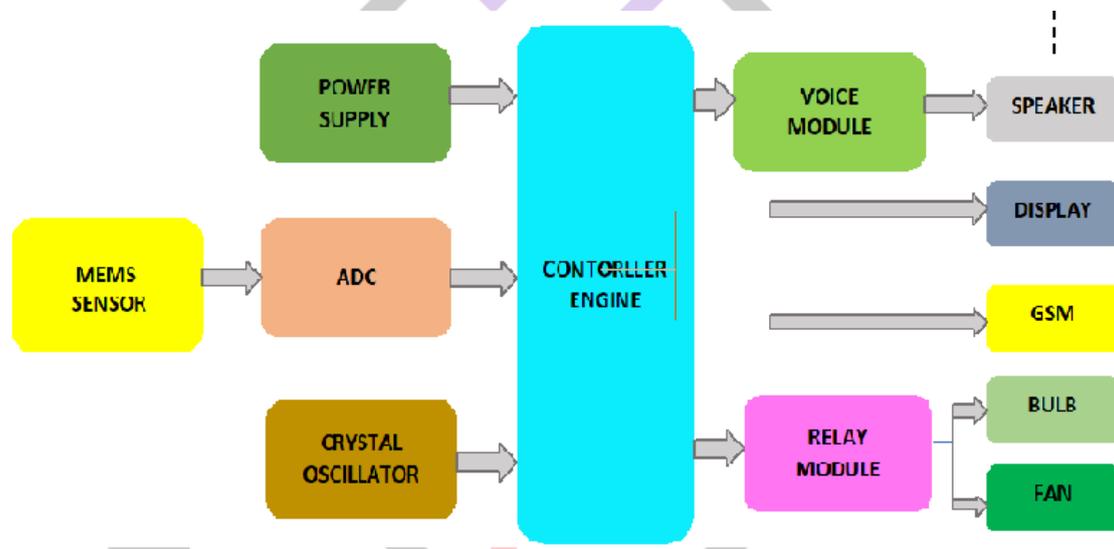
III. IMPLEMENTATION

Figure 1. Block Diagram

A 9V DC power supply is given to Arduino mega using adaptor. It will take 5-10 seconds to activate the code. The sim inserted in the GSM module will be activated, previous commands will be deleted and it displays like sim registered, message deleted, sim activated, and Emergency alert system.

By operating the MEMS sensor in four directions the output will be generated. By tilting the first MEMS sensor right side the command "need food", for left side "need water", towards downward direction "need tablets" and upwards "take me to washroom". Which are previously stored in the voice and playback module and these commands will be displayed on LCD and audio signal through speaker.

By tilting the second MEMS sensor right side "Light will be ON", for left side "Fan will be ON", towards downward direction "Buzzer will be activated" and at last by tilting it in upward direction all the above three cases will be deactivated "Light Fan Buzzer OFF".
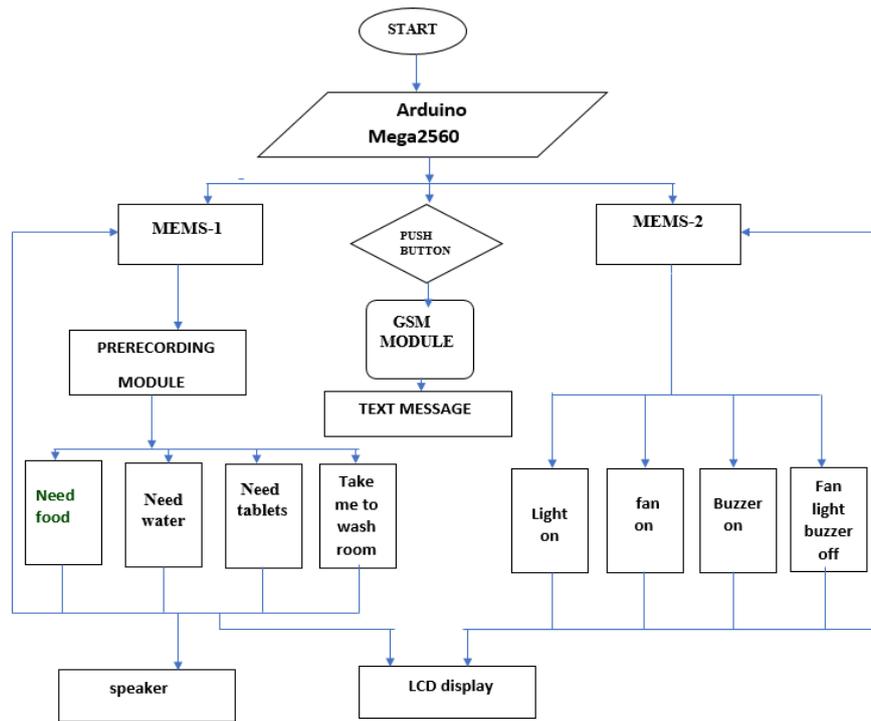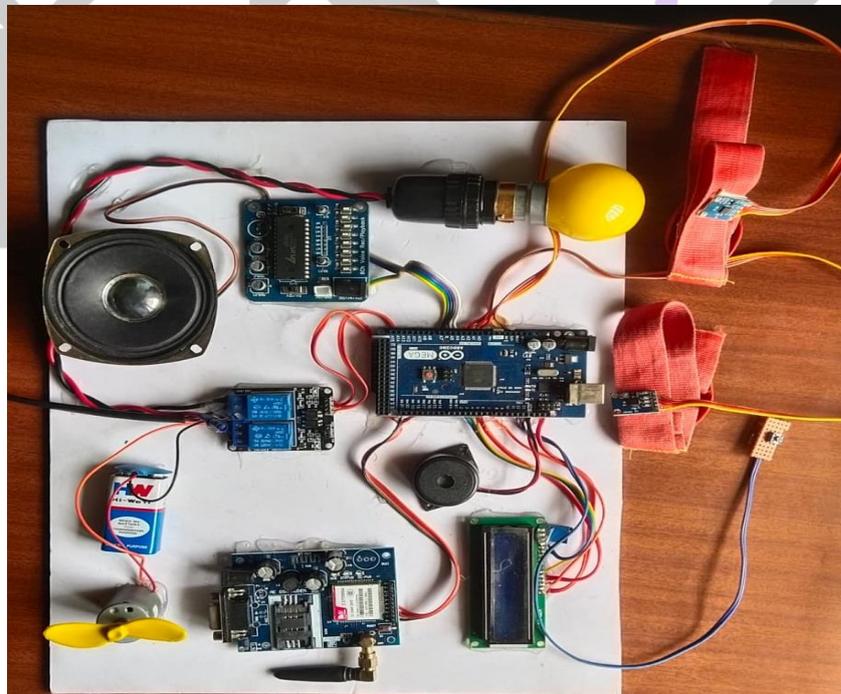
Figure 2. Flowchart Diagram

An emergency buzzer will be activated by operating the push button, also TEXT message will be sent through GSM module form the registered SIM to the given mobile numbers in the code. The buzzer will be in active position until the text message will be received by first registered mobile number.

IV. RESULTS

The design of hardware components are done and processed by Arduino mega2560. The software implementation is by Arduino IDE tool. Here are the figures of the results.

V. CONCLUSION & FUTURE SCOPE

NO. OF MEMS SENSOR USED	CONDITIONS	LIGHT	FAN	SPEAKER	LCD	BUZZER
MEMS 1	Need Water	OFF	OFF	ON	ON	OFF
	Need food	OFF	OFF	ON	ON	OFF
	Need Tablets	OFF	OFF	ON	ON	OFF
	Take me to Washroom	OFF	OFF	ON	ON	OFF
MEMS 2	Light On	ON	OFF	OFF	ON	OFF
	Fan On	OFF	ON	OFF	ON	OFF
	Buzzer On	OFF	OFF	OFF	ON	ON
	Light, Fan , buzzer Off	OFF	OFF	OFF	OFF	OFF

5.1 Conclusion

In this thesis the hand gesture recognition of the unit is validated on Arduino mega microcontroller board using gsm module and Arduino ide software with an accurate result of 98%. The performance of the proposed system is highly depends on the result of the hand gesture. Sign language is the medium for disabled people to share their feelings or thoughts with others. But their communication is restricted to other disabled persons as normal who cannot understand what they wants to say. The vision-based solutions can overcome some of their difficulties and disadvantages, they appear to be the best choice for raw data collection. This system converts the sign language into voice and displayed on LCD which is easily understandable by disabled and normal people. Also it provides a cheap, portable and efficient solution.

5.2 Future Scope

We are using the SIM900 GSM Shield to make connectivity over long distances. But we are using only text message feature of this technology. In future some new way can be developed that can use the Internet connectivity feature of GSM Shield to make the connectivity of the device better and for longer distances. And there can be more perfection in sensing the movements and gestures so that the message transmission can be made smoother. Since this is a type of wearable technology, we can think of new advancements that can be implanted so that the device can be made more compact, faster and reliable. This system can also be implemented using wireless technology for easy handling and can able to carry easily.

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