AUTOMATED PARALYSIS PATIENT HEALTH CARE SYSTEM

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Abstract - *The noble aim behind this project is to design a health care system which will be helpful for paralyzed and mute people . A Dumb individual all through the world uses gesture based communication for the correspondence. The progression in implanted framework can give a space to plan and build up an interpreter framework to change over the communication via gestures into discourse. As sign language primarily used by deaf but also used by people who can hear having problem in speaking so the approach used in this analysis is vision based. The glove uses are fitted with flex sensor in three dimensions to collect the data from every position of figure and hand motion to differentiate and distinguish each and every word from a particular sign. Heart attack is the major reason for death among both genders men and women. However, its occurrence cannot be always predictable. Most common device used to detect heart related problems is an EKG machine which is reliable to normal user, but is not mobile enough to be used as a monitoring device for a heart patient continuously. This project is to develop an algorithm for detecting a heart attack and if so, then to alert doctors, family members and emergency services .Hence here we introduce a smart health care system which will take care of problems and need of paralyzed and mute people and will also help in detection of heart attack.*

Key Words: **flex sensor, Mute People, Gesture Recognition, sign language.**

1. INTRODUCTION

"AUTOMATED PARALYSIS PATIENT HEALTH CARE SYSTEM "is a recognition system for the vocally disabled. In real world, there are many people who are paralytic and cannot communicate easily. Motions can be used to communicate words and sentence to audience. The work of this project is to provide aid to such people with the help of motions and sensors. A motion is used to provide a medium of sign for communication. The work includes use of various electronic components such as sensors, microcontrollers which will help the disabled as well as the society.

For communication of paralytic people and electronic automated paralysis patient health care system is developed. It is portable and very easy to handle. In this project angle sensor are used to convert physical parameter into electrical signal, which can be read by an observer or by an instrument. So with help of this system the barrier faced by the paralytic people in communicating with society can be reduced to great extent.

Various conditions such as stress, blood pressure and improper functioning of central nervous systems are reasons which lead in paralytic attacks. Patient who had paralytic attack have their whole or partial bodies disabled. This paralytic patient can neither speak nor express their demands or wishes. These patients cannot have quick reflex system, hence there is no or less coordination between vocal systems, limbs and brain. In such situation, this proposed project can come to the rescue. The patient can communicate by displaying the message on the LCD screen by simple motion of their functioning body parts. The particular aspect of this device is that if no one is near by the patient, he can send the message in the form of a SMS to the family members or their caretaker through the developed mechanism.

2. LITERATURE SURVEY

According to a survey, nearly 1 in every 5000 people are paralyzed. Fully paralyzed patients require 24 hour support. But in this days, it is not possible to constant monitor patient. So they need a person which take care's movement disabled or paralyzed patient. And appliances cannot be handled by them. So they need constant help and they cannot work independently there are various applications which can be drive from eye blink detection and these are not limited. Anefficient, real time blink detection can be used for almost any purpose. It can be used for on/off appliances such as lighting devices, fan, television or a microwave oven. Electrooculographic direction of a wheelchair utilizing eye development A convenient remote eye development controlled Human Computer Interface (HCI) for debilitated individual Eye controlled turning on and off the electronic gadgets Launching the rocket utilizing look in war field A few inquires about have been done as of late to develop Human Computer Interface [HCI][4].Human Computer Interface as an assistive innovation helps the general population with engine incapacities and who can't move their arms thus mind boggling human PC interface must be more developed, specific to that of the information charges, adjusted - to the incapacity of the user, designed in a sheltered and straightforward way. Under to human PC interface

the most developed. The primary point of the proposed framework is to build up a financially savvy framework which can offer voicetovoicelessindividualwiththeassistanceof Smart Gloves. Itimpliesthatutilizing brilliantglovescorrespondencewon'tbe obstruction between two distinct groups and they will have the capacity to discuss effortlessly with the typical individual. Utilization of keen glove by individual with incapacity influences country to develop and furthermore they won't vary themselves from the typical individuals. In this paper Quiapo et.al. Cover the various prevailing methods of deaf-mute communication interpreter system. The two broad classification of the communication methodologies used by the deaf –mute people are - Wearable Communication Device and Online Learning System. Under Wearable communication method, there are Glove based system, Keypad method and Handicom Touch-screen. All the above mentioned three sub-divided methods make use of various sensors, accelerometer, a suitable micro-controller, a text to speech conversion module, a keypad and a touch-screen. The need for an external device to interpret the message between a deaf –mute and non-deaf-mute people can be overcome by the second method i.e online learning system. The Online Learning System has different methods. The five subdivided methods are- SLIM module, TESSA, Wi-See Technology, SWI_PELE System and Web-Sign Technology [1].

In another research Abhinandan Das et.al proposed ISLR system is considered as a pattern recognition technique that has two important modules: feature extraction and classification. The joint use of Discrete Wavelet Transform (DWT) based feature extraction and nearestneighbour classifier is used to recognize the sign language. The experimental results show that the proposed hand gesture recognition system achieves maximum 99.23% classification accuracy while using cosine distance classifier [2] . In their research Anetha K et.al. presented a scheme using a database driven hand gesture recognition based upon skin color model approach and thresholding approach along with aneffective template matching with can be effectively usedfor human robotics applications and similar other applications.. Initially, hand region is segmented by applying skin color model in YCbCr color space. In the next stage thresholding is applied to separate foreground and background. Finally, template based matching technique is developed using Principal Component Analysis (PCA) for recognition [3]. Aarthi M et.al. Presented the static hand gesture recognition system using digital image processing. For hand gesture feature vector SIFT algorithm is used. The SIFT features have been computed at the edges which are invariant to scaling, rotation, addition of noise [4]. Priyanka Lokhande et.al proposed a method for automatic recognition of signs on the basis of shape based features is presented. For segmentation of hand region from the images, Otsu's thresholding algorithm is used, that chooses an optimal threshold to minimize the within-class variance of threshold black and white pixels. Features of segmented hand region are calculated using Hu's invariant moments that are fed to Artificial Neural Network forclassification. Performance ofthe systemis evaluated on the basis of Accuracy, Sensitivity and Specificity [5].

Another Authors Anetha K et.al presented various method of hand gesture and sign language recognition proposed in the past by various researchers. For deaf and dumb people, Sign language is the only way of communication. With the help of sign language, these physical impaired people express their emotions and thoughts to other person [6]. Priyanka R Potdar et.al. Proposed a system to aid communication of deaf and dumb peoplecommunicationusing Indiansignlanguage (ISL) with normal people where hand gestures will be converted into appropriate textmessage. Main objective is to designan algorithm to convert dynamic gesture to text at real time. Finally after testing is done the system will be implemented on android platform and will be available as an application for smart phone and tablet pc [7]. Another Author proposed a real time vision based system for hand gesture recognition for human computer interaction in many applications. The system can recognize 35 different hand gestures given by Indian and American Sign Language or ISL and ASL at faster rate with virtuous accuracy. RGB-to-GRAY segmentation technique was used to minimize the chances of false detection. Authors proposed a method of improvised Scale Invariant Feature Transform (SIFT) and same was used to extract features. The system is model using MATLAB. To design and efficient user friendly hand gesture recognition system, a GUI model has been implemented [8].

One of the researcher Sachin Bhatt et.al. Presented the recent research and development of sign language based on manual communication and body language. Sign language recognition system typically elaborate three steps preprocessing, feature extraction and classification .Classification methods used for recognition are Neural Network (NN), Support Vector Machine(SVM), Hidden Markov Models (HMM) [9]. Mukul Singh Kushwah et.al. Presented application that helps the deaf and dumb person to communicate with the rest of the world using sign language. The key feature in this system is the real time gesture to text conversion. The processing steps include: gesture extraction, gesture matching and conversion to speech. Gesture extraction involves use of various image processing techniques such as histogram matching, bounding box computation, skin colour segmentation and region growing. Techniques applicable for Gesture matching include feature point matching and correlation based matching. The other features in the application include voicing out of textand text togestureconversion[10].

3. PROPOSED SYSTEM

Sign languages are languages that use the visual-manual modality to convey meaning. Language is expressed via the manual sign stream in combination with non-manual elements. Sign languages are full-fledged natural languages with their own grammar and lexicon. This means that sign languages are not universal and they are not mutually intelligible, although there are also striking similarities among sign languages.

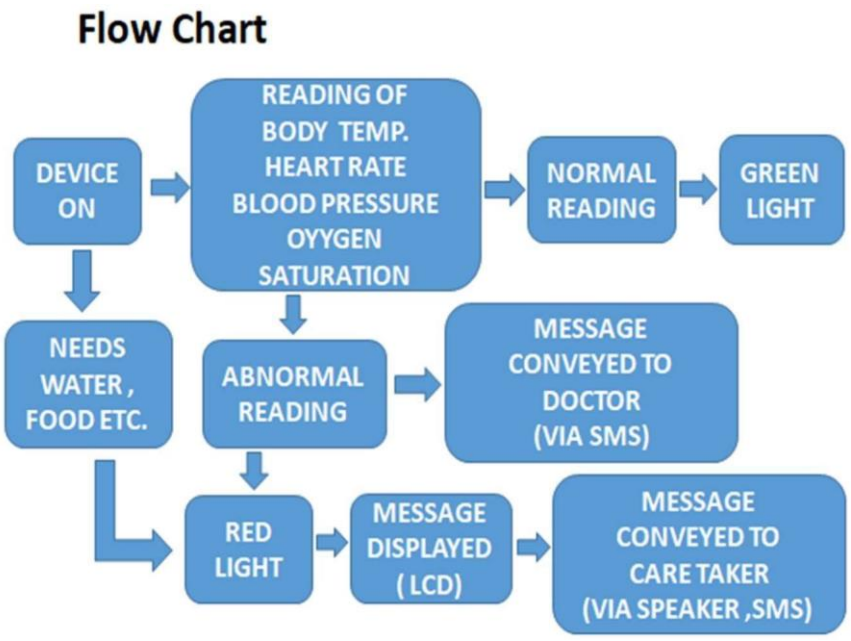


Fig -1: Block diagram of Assisting System for Paralyzed and Mute People with Heart Rate Monitoring

Linguists consider both spoken and signed communication to be types of natural language, meaning that both emerged through an abstract, protracted aging process and evolved over time without meticulous planning. Sign language should not be confused with body language, a type of nonverbal communication. Wherever communities of deaf people exist, sign languages have developed as handy means of communication and they form the core of local deaf cultures. Although signing is used primarily by the deaf and hard of hearing, it is also used by hearing individuals, such as those unable to physically speak, those who have trouble with spoken language due to a disability or condition (augmentative and alternative communication), or those with deaf family members, such as children of deafadult.

In this system we used handicap wheelchair which basically works on the principle of acceleration, one acceleration sensor, provides two axes, acceleration sensors whose output is analog, varies according to acceleration applied to it, by applying simple formula we calculate the amount of tilt and output of tilt will decide to move in which direction. Sensorgives X-axis and Y-axis output independently which is fed to ADC and then micro controller and depending on the pulse width it decides to move or not. As from the circuit diagram it is clear that we have used micro controller AVR. So the accelerometer sensor is connected to the port 3 of micro controller. Depending on the movement of sensors, the motor moves in any of the four directions (i.e. left, right, forward, backward). If the four fingers of the left hand are bend the wheel chair will move in forward direction. And if the middle two fingers of the left hand are bend then the wheel chair moves in reverse direction. If the two fingers from the right hand side are bend then wheel chair moves in right direction. In the same way if the two fingers from the left hand side are bend then the wheelchair moves in the left direction. Similarly, the movement of single fingers are bend one by one then various commands are recorded on that particular movements for helping thepatient.

4. SYSTEM IMPLEMENTATION

RECEIVER:

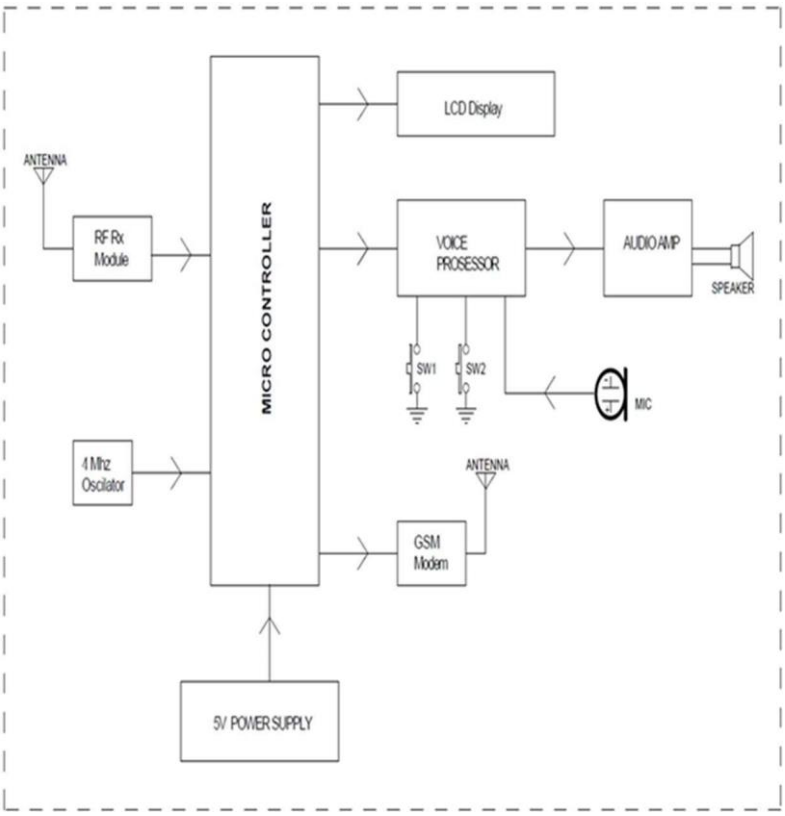
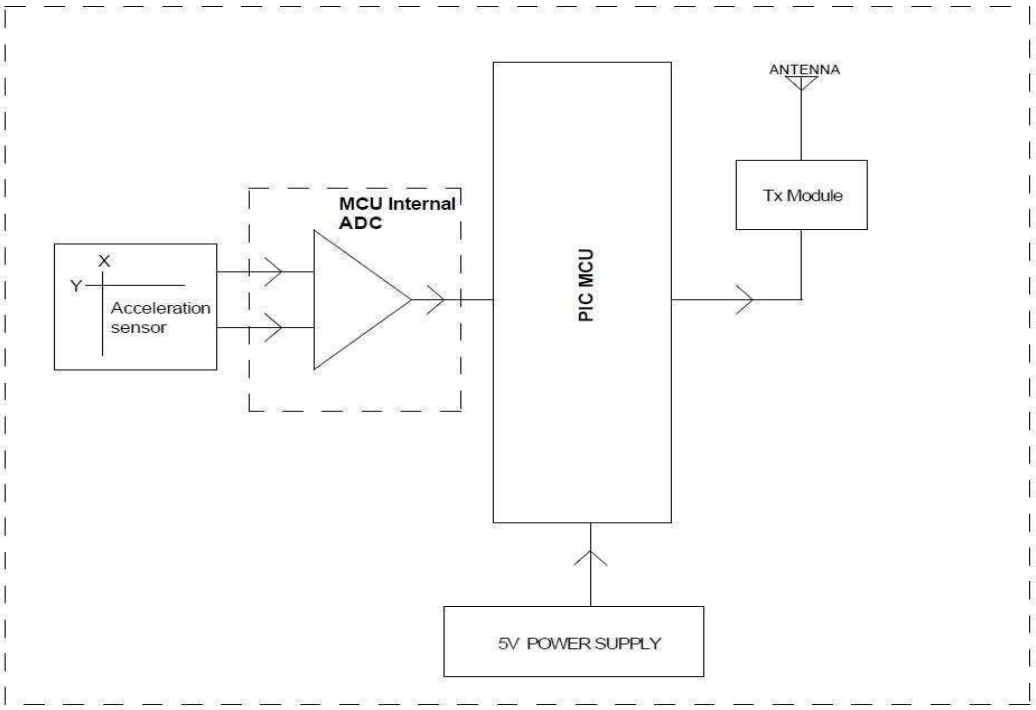


Fig -2: Circuit diagram of Assisting System for Paralyzed and Mute People .

The antenna starts the job of reception it gives the signal to receiver module. The receiver module receives it and de module the signal, it can be any amplifier (required one only).4MHz Oscillator is used to give clock to the microcontroller as a carrier.5V regulated supply is used for voltage supply. Then the signal fed to microcontroller if the motion of hand is continuously on the microcontroller will send a SMS to the number shared in it and it will show the output on LCD display. If motion looks normal or not incontinuous type it will just show to on LCD display. LCD display is used to show the output which is given by microcontroller. The GSM modem used to send a SMS on the number which is saved in it. It need a SIM cared for transmission of message.

TRANSMITTER:



The transmitter is the attached to the patient it contains the acceleration sensor, analog /digital converter, PIC microcontroller and transmitter module the 5V power supply is attached to it for the input. As the acceleration sensor is work on the motion, it converts hand (Mechanical) energy to electrical (analog)energy it gives to ADC.ADC is used to convert analog signal (continuous signal) into digital signal (bit sequence) as output is given to microcontroller. The 5V voltage regulator is attached with microcontroller for giving voltage to it. As microcontroller gets the information is send a message to the number to receiver end via transmitter module. Through transmitter module the signal is radiated on receiver via a antenna. Signal generated by transmitter is goes to the receiver end. ADC is used to give the desire output which PIC microcontroller needed and makes the circuit easy. Antenna gives extra gain (dB) for better transmission through air.

Fig 3. -: Automated Paralysis Health Care System.

4. EXPERIMENTAL RESULTS

Transmitter

Power Supply Testing	Microcontroller Testing
1)Input Voltage Testing- 11.96v dc (12v dc),	1)Pin no 19 is ground.
2)After Connecting Power Supply LED should be ON.	2)Pin no 20 is VCC- 4.98v.
3)Voltage Regulator IC Input Voltage- 11.27v.	3)Pin no 6 is ground.
4)Pin 1 is input.	4)Pin no 20 is VCC- 4.98v.
5)Pin 2 is Ground.	5)Pin no 1 reset input voltage- 5.4v.
6)Voltage Regulator IC Output Voltage -4.98v(5v regulator)	
7)Pin No 3 is output pin.	

Receiver

Power Supply Testing	Microcontroller Testing	LCD Testing
1)Input Voltage Testing- 11.96v dc	Pin no. 1 Reset input voltage: - 4.75v	Pin no.1 is ground
2)After Connecting Power LED should be ON.	Pin no. 11 is VCC: - 5V	Pin no.2 is VCC: -5v
3)Voltage Regulator Input 10.51v.	Pin no.12 is ground	Pin no. 15 is VCC: - (Note- LCD backlight supply (5v)
4)pin 1 is input	Pin no.31 ground	Pin no. 16 is ground
5)pin 2 is ground	Pin no. 32 VCC: -5v	Pin no.3 is contras voltage input: - 0 to 5v variable
6)Voltage Regulator IC output -5v		

5. CONCLUSION

- Processing speeds of computers have increased dramatically, with computers being advanced to the levels where they can assist humans in complex tasks.
- It is justified that sign language decoding using these modern techniques helps in achieving more efficiency in the field of gesture recognition thus making it easy to understand for everyone.

- To continue this moment, it is clear that further research in the areas of future extraction, classification methods, and gesture representation are required to realize the ultimate goal of humans interfacing with machines on their own natural terms.

- This project is useful for deaf and dump people those cannot communicate with normal person. It is also useful for speech impaired and paralysed patient means those do not speak properly.

6. REFERENCES

[1] Fels and G Hinton "Glove-talk: A neural Network Interface between a Data-Glove and a Speech Synthesizer", IEEE Transactions on Neural Networks, 4-1, pp. 2-8.1993.

[2] Corradini, Andrea, Horst-Michael Gross. 2000, "A Hybrid Stochastic- Connectionist Architecture for Gesture Recognition'', 2000 IEEE, 336-341.2000

[3] K. Solanki, ''Indian Sign Languages Using Flex Sensor Gloves'', IJETT, Volume-4, Issue-6, June 2013.

[4] S. Ahmed. C. Abdul Melvisharam, ''Hand Gesture Recognition and Voice conversion system for Differentially Able Dumb People'', Hakeem college of Engineering and Technology Vellore, Tamil Nadu 632 509. 2012

[5] J. Ravikiran, K. Mahesh, S. Mahishi, R. Dheeraj R, "Finger Detection for Sign Language Recognition" International Journal of Development Research. Vol. 4, Issue-3, pp. 749- 752, March 2014.

[6] J. Haydar, B. Dalal, S. Hussainy, L. Khansa, Walid Fahs submitted report on "ASL Finger Spelling Translator Glove", Faculty of Engineering, Islamic University of Lebanon Khandesh, Lebanon,2000

[7] T. Dasgupta, S. Shukla, S. Kumar, S. Diwakar, A. Basu submitted report on "A Multilingual Multimedia Indian Sign Language Dictionary Tool", department of Electronics & Communication engineering,andra-pradesh,2012

[8] S. Bandopadhyay, "Sign language glove with voice synthesizer" Department of Electronics & Communication Engineering, RCC-Institute of Information Technology, West Beng University of Technology, June-2012.

[9] S. Mitra and T. Acharya, "Gesture Recognition: A Survey", IEEE transactions on systems, man, and cybernetics—part c: applications and reviews, vol. 37, no. 3, page no. 311-317, MAY 2007

[10] I. Vladimir R. Sharma and T. Huang, "Visual Interpretation of Hand Gestures for Human-Computer Interaction: A Review", IEEE transactions on pattern analysis and machine intelligence, vol. 19, no. 7page no. 677-68., JULY 1997.

[11] M. Sweta, A. Raut and N. Janwe, "A Review of Gesture Recognition Using Image Object Comparison and Neural Network", International Journal of Computer Technology and Electronics Engineering (IJCTEE) National Conference on Emerging Trends in Computer Science and Information Technology (NCETSIT-2011), PageNo.57-58.

[12] M. Mokhtar, P. Mishra, "Hand Gesture Modeling and Recognition using Geometric Features: A Review", Canadian Journal on Image Processing and Computer Vision Vol. 3 No. 1, Page No. 13-16., March 2012

[13] H. Gunes and M. Piccardi, "Automatic Temporal Segment Detection and Affect Recognition from Face and Body Display", IEEE transactions on systems, man, and cybernetics—part b: cybernetics, vol. 39, no. 1, Page No. 70-72. FEBRUARY 2009

[14] Gloves Translate Sign Language to Speech "http://www.escapistmagazine.com/" 2012

[15]http://dspace.bracu.ac.bd/xmlui/bitstream/handle/10361/10106/12321021%2C12301040%2C14121084%2C12301048_CSE.pdf?sequence=1&isAllowed=y

[16]https://www.researchgate.net/publication/329268152_Heart_Attack_Detection_and_Heart_Rate_Monitoring_Using_IoT

[17]https://krex.kstate.edu/dspace/bitstream/handle/2097/38268/NarasimhaRaoJastiMadhu2017.pdf?sequence=3

[18]http://www.ijfrcsce.org/download/browse/Volume_4/May_18_Volume_4_Issue_5/1526794433_20-05-2018.pdf