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GSM Based Fall Alert Monitoring System Using Keypad Device

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***Abstract*: The International Classification of Diseases 11 (2018), published by the World Health Organization, divides vision impairment into two categories: distance and near-presenting vision impairment. The system proto-type is necessary. It is a control order from the opera-tor. It is the main form of communication for mute, visually impaired, and hearing persons. The goal of this initiative is to improve the quality of life for people with disabilities. By making things more accessible, it will be easier to meet their requirements and offer them challenges that will keep them motivated. The improvement of speech, hearing, and vision impairments is the main goal of this initiative. Here, organizing and categorizing the portable keyboard device for information transfer from one location to another is the major objective.**

***Keywords*: Pregnancy women, Fetal monitoring system, Heart rate pulse sensor, Accelerometer sensor, Internet of Things, Arduino Uno.**

1. Introduction

People were not consciously aware of the necessity of communication since it is such an outward and essential component of life that is deeply ingrained. Significantly, it affects social and emotional functioning; for example, a lack of communication may result in emotions of estrangement, resentment, and loneliness. Only a tiny portion of the heading community uses sign language, and even fewer of them are able to comprehend it. The deaf community and the rest of society are thus faced with a serious contact barrier problem, which hasn't been fully addressed to address the problem [1]. Thanks to an in-creasing number of applications, technologies are already an inherent part of everyday life. Applications are becoming more complicated because to the increased processing speed and power of processors and sensors. As a result, the need for better human-machine interaction is rising proportionately [2]. For the purpose of recognizing objects and actions, a lot of effort has been done on merging various feature types. We explain each activity at several sizes using different data channels [3]. The difficulty in conversing with loud people is undoubtedly the main problem for the group that is not very smart. These processes' productivity is dependent upon the demands of Leeway for the suggested frame work emphasizes its ability to produce an interpretation of sign to letter with little effort and can be used to talk to a wider range of words. Complicated frame work with a lot of hand and body signal to convey the significance. Promote the framework, which requires fewer sensors and is easier to implement, which results in a further cost reduction [4]. To overcome the communication barrier with persons who are not acquainted with sign language, it is crucial to develop hand action systems like sign language applications. This barrier can be lessened by technology that converts hand motion into audible speech for a non-signer to understand. One such tool is the vision-based recognition system, which is one of the communications supports assistive technology that can be used in a variety of communication education and rehabilitative tools [5]. As a result, we have a completely working smart speaking system that uses a basic wearable device to enable mute persons to converse with hearing people. With the use of GSM and vibration sensor monitoring, any closed vibration motor on an item will notify the user that any fall-down event involving the object will result in quick reporting to a third party

2. Related Works

Proposed that Sign language is the predominant mode of communication for the hearing-impaired com-munity. For the millions of people who suffer from hearing loss around the world, interaction with people who have the ability to hear and do not suffer from hearing impairment or loss is considered as complicated. In line with this issue, technology is perceived as a crucial factor in being an enabler of providing solutions to enhance the quality of life of the hearing impairment by increasing accessibility [1].

Proposed to control a tele operated robotic grip-per to grasp objects of different shapes using an efficient posture classification algorithm. Two Inertial Measurement Unit sensors are attached to a wearable glove and using it the human operator performs 5 different postures related to grasping. The feature selected for experimentation is Unit Quaternion. Classification is done with 2 different classifier algorithms, Neural Networks and Random Forests. This is followed by a basic map-ping to a 10 degrees of freedom robotic hand. A comparative study of the classifier algorithms is carried out to select the most efficient algorithm for sensor based posture recognition [2].

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Proposed that Electronic Glove or E-Glove was developed as a teaching aid for the hearing impaired particularly children. E-Glove makes use of the American Sign Language (ASL) as the basis for recognizing hand gestures. It was designed using flex sensors and an accelerometer to detect the degree of bend made by the fingers as well as a movement of the hand. E-Glove transmits the data received from the sensors wirelessly to a computer and then displays the letter or basic word that corresponds to a gesture made by the individual wearing it. E-Glove provides a simple, accurate, reliable, cheap, speedy gesture recognition and user-friendly teaching aid for the instructors that are teaching sign language to the deaf and mute community [3].

Proposed that Hand gesture recognition as a key for overcoming many difficulties and providing convenience for human life. The ability of machines to under-stand human activities and their meaning can be utilized in a vast array of applications. One specific field of interest is sign language recognition. This paper provides a thorough review of state-of-the-art techniques used in recent hand gesture and sign language recognition research. The techniques reviewed are suitably categorized into different stages: data acquisition, pre-processing, segmentation, feature extraction and classification [4].

Proposed that the deaf community relies on sign language as the primary means of communication. For the millions of people around the world who suffer from hearing loss, interaction with hearing people is quite difficult. The main objective of sign language recognition (SLR) is the development of automatic SLR systems to facilitate communication with the deaf community. This work presents a comprehensive comparison between two different recognition techniques for continuous ArSLR, namely a Modified k-Nearest Neighbour which is suitable for sequential data and Hidden Markov Models (HMMs) techniques based on two different toolkits [5].

3. Working Process

Propose a smart speaking system that helps mute people in conveying their message to regular people using hand motions and gestures. The system makes use of a hand motion reading system equipped with motion and keyboard with a speaker unit. This system is powered by power supply circuitry to run it. Microcontroller is used for processing the data and operating the system. The system consists of around 3 stored messages like “need food” and “need restroom”, etc., where is the and so on that help mute people convey basic messages for voiceover. The system reads persons hand motions for different variations of hand movement. It also consists of a trigger sensor in order to in date that the person wishes to activate the system and speak something a receives input sensor values and then processes it. Now it searches for matching messages for the set of sensor values. Once it is found in memory this message is retrieved and is spoken out using text to speech processing through the interfaced speaker. Thus, we have a fully functional smart speaking system to help mute people communicate with regular people using a simple wearable system. Any object to closed vibration motor on to inform to close that the object any fall down situation immediately notification to another per-son with help of GSM and vibration sensor monitoring.

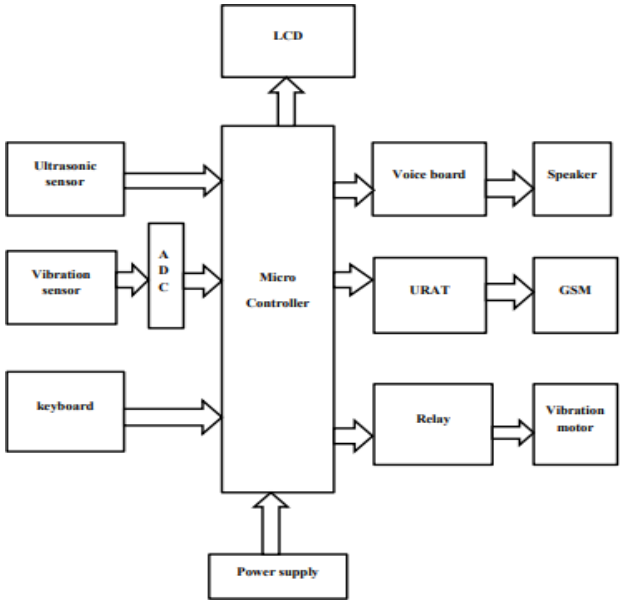

Fig. 1. Block diagram of fall alert monitoring system

The AT89S52 is a low-power, high-performance CMOS 8-bit microcontroller with 8K bytes of in-system programmable Flash memory. The device is manufactured using Atmel’s high-density nonvolatile memory technology and is compatible with the Indus-try standard 80C51 instruction set and pin out. The on-chip Flash allows the program memory to be reprogrammed in-system or by a conventional nonvolatile memory pro-grammar. By combining a versatile 8-bit CPU with in-system programmable Flash on a monolithic chip, the Atmel AT89S52 is a powerful microcontroller which provides a highly-flexible and cost-effective solution to many embedded control applications. In addition, the AT89S52 is designed with static logic for operation down to zero frequency and supports two software selectable power saving modes. The Idle Mode stops the CPU while allowing the RAM, timer/counters, serial port, and interrupt system to continue functioning. The Power-down mode saves the RAM con- tents but freezes the oscillator, disabling all other chip functions until the next interrupt or hardware reset.

4. Hardware Requirement

A. GSM Modem

GSM (Global System for Mobile communications: originally from Group Special Mobile) is the most popular standard for mobile phones in the world. Its promoter, the GSM Association, estimates that 80% of the global mobile market uses the standard. GSM is used by over 3 billion people across more than 212 countries and territories. Its ubiquity makes international roaming very common be-tween mobile phone operators, enabling subscribers to use their phones in many parts of the world. GSM differs from its predecessors in that both signaling and speech channels are digital, and thus is considered a second

generation (2G) mobile phone system. This has also meant that data communication was easy to build into the system. GSM EDGE is a 3G version of the protocol.

Fig. 2. GSM modem

B. Ultrasonic Sensor

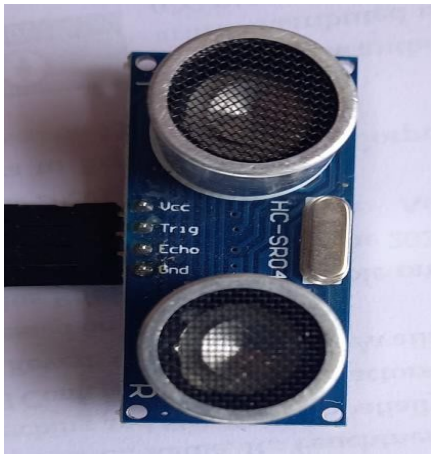

Fig. 3. Ultrasonic sensor

Ultrasonic sensors (also known as transceivers when they both send and receive) work on a principle similar to radar or sonar which evaluate attributes of a target by interpreting the echoes from radio or sound waves respectively. Ultrasonic sensors generate high frequency sound waves and evaluate the echo which is received back by the sensor. Sensors calculate the time interval between sending the signal and receiving the echo to determine the distance to an object. This technology can be used for measuring: wind speed and direction (anemometer), fullness of a tank and speed through air or water. For measuring speed or direction a device uses multiple detectors and calculates the speed from the relative distances to particulates in the air or water. To measure the amount of liquid in a tank, the sensor measures the distance to the surface of the fluid. Further applications include: humidifiers, sonar, medical ultra-sonography, burglar alarms and non-destructive testing.

C. Voice Board

The APR9600 experimental board is an assembled PCB board consisting of an APR9600 IC, an electrets microphone, support components and necessary switch-es to allow users to explore all functions of the APR9600 chip.

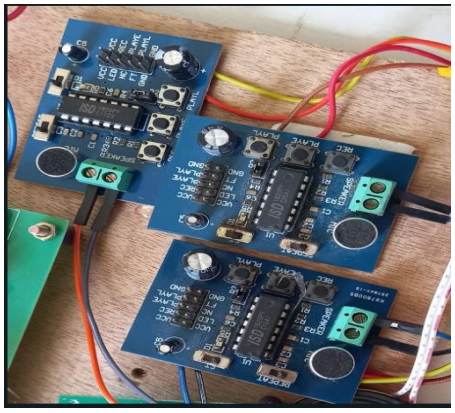

Fig. 4. Voice board

D. LCD

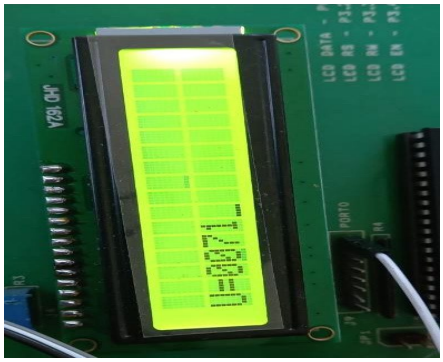

Fig. 5. LCD

The LCD can work in two different modes, namely the 4- bit mode and the 8-bit mode. In 4-bit mode we send the data nibble by nibble, first upper nibble and then lower nibble. For those of you who don't know what a nibble is: a nibble is a group of four bits, so the lower four bits (D0- D3) of a byte form the lower nibble while the upper four bits (D4-D7) of a byte form the higher nibble. This enables us to send 8-bit data. Whereas in 8-bit mode we can send the 8-bit data directly in one stroke since we use all the 8 data lines. 8- bit mode is faster and flawless than 4-bit mode.

E. Keypad 1×5 Matrix

Fig. 6. Keypad 1×5 matrix

A Matrix keypad defined as a small compact in-put device that accepts user input and processed by the microcontrollers. These keys arranged as rows and columns. This 1×5 Key Matrix Membrane Switch Keypad designed as a high-quality product at an affordable rate for various applications. 1*5 matrix keypad designed as a non- encoded keypad consists of 5keys in parallel with a built-in pushbutton. This 1*5 matrix keypad designed as a membrane keypad with no moving parts. Hence, an additional female 6- pin pitch connector required for inter-facing it with

your microcontroller circuits.

5. Result and Discussion

From this project, we are designed a device which gives alert in form of text message, vibration, and voice message. It has three keys; The first key comprises of ultrasonic sensor that detect the nearby movement and give vibration.

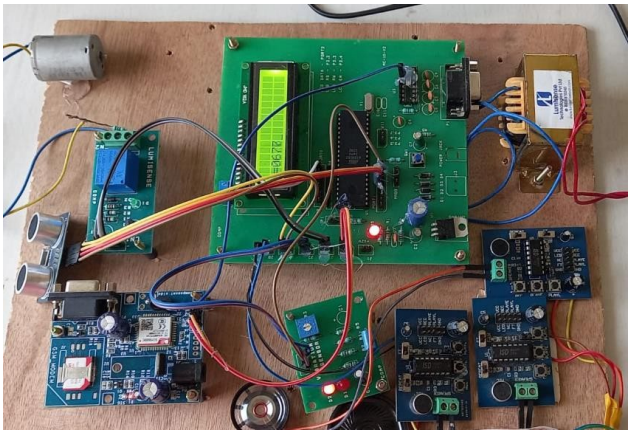

Fig. 7. Fall alert monitoring system

The second key comprises of voice text message which has the required needs of the impaired patient, and the third key comprises of alert notification which will be send to the guardian whenever the patient feels any dis-comfort.

6. Conclusion

In this paper, a new method of wheel chair control is discussed and is implemented. The prototype for the system is developed which is believed to be better because of low cost and also of lesser amount of force is required to use as compared to the joystick-control system, in which more force is required to move it. Further improvement includes a new system for improving the obstacle avoidance and to include the braking system.

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