

Health Care Monitoring System using EMG Sensors

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ABSTRACT

Health surveillance of the paralyzed in the hospitals reveals that, there are many exercises, stimulation and medicines to safeguard the unfit folks. However there's not a specific observance system to observe the health conditions of the unfit. To beat these issues an observance system is introduced, that is employed to visualize the patients' health condition. Sharing of patient information among clinicians, departments & even patients is rare and complicated. Grasp cloud & IoT technical in health care also be a solution to enabling health care organization to focus their efforts on clinical relevant services and patient outcomes which can build health observance diagnostics treatment in additional timely, convenient manner with the reduced price.

Keyword: Microcontroller, EMG sensor, Flex sensor.

Introduction

Healthcare systems are an awfully necessary part of the economy of any country and for the general public health. During this quick pace of life, it's troublesome for folks to be perpetually out there for his or her close to one's World Health Organization would possibly want them whereas they're stricken by the troublesome. Patient observance system live physiological characteristics either endlessly or at regular intervals of your time [1]. The recent survey of world health organization calculable close to 5.6 million folks were unfit representing 1.9% of the population, roughly one among 50. During this observance system, bio sensors are used to sense the vital framework of patients like heart rate, blood pressure, airflow sensor and these parameters are measured endlessly and transmits the message

to the caretaker by victimisation GSM. This may be processed in Microcontroller.

In a very wearable system, the muscle shortening is collected via diagnostic procedure (EMG) technology that is an electro diagnostic medicine technique for evaluating and recording the electrical activity created by skeletal muscles. Electromyogram technology is used in wide selection of application like diagnosis and rehabilitation, sport science analysis, contestant observance, human machine interaction and gesture recognition.

Arduino Uno is microcontroller board supported the ATmega328P. Its 14 digit input/output pins (of 6 dozen may be used as PWM outputs), half-dozen analog inputs, a 16 MHz quartz, an usb association, power jack, an ICSP header and a push button. It contains everything required to support the microcontroller, easy association to a pc with a USB cable or power it with an AC-to-DC device or battery to get started.

Working principle

Paralytic patients World Health Organization have their whole or partial body disabled by the palsy attack. These folks in most cases aren't ready to convey their wants as they're neither ready to speak properly nor do they convey through language attributable to loss in control by their brain. In such a state of affairs we tend to propose a system that helps disabled person in displaying a message over the LCD by simple easy motion of any part of his body that has motion skills. This technique additionally takes care of true whereby nobody is present to attend the patient and therefore causation a message through GSM of what he desires to convey in SMS. Our proposed system works by reading the lean direction of the user half. The user currently simple must tilt the device in a very explicit angle to convey a message. Tilting the

device in several directions conveys a unique message. Here we tend to use measuring system so as to live the statistics of motion. It then passes on this information to the microcontroller. The microcontroller processes the information and displays the actual message as per input obtained. The microcontroller currently displays the associated message on the LCD screen. It additionally sounds a buzzer in conjunction with message as presently because it receives motion signal from the measuring system. If there was nobody to attend to the message displayed on the LCD, as shown in fig.1. & 3. The patient will tilt the device for a few more quantity of your time which can trigger AN SMS to be sent through a GSM electronic equipment to the registered care taker of the patient with the message that the patient desires to convey. during this approach the automatic palsy Patient Care System actually automates the care taking ability of the patient that ensures a timely attention to the patient and therefore for an honest health of the patient.

System description

The system is meant and designed victimisation the microcontrollers, mems device, flex device. In fig.1. MEGA 328P processor is employed and therefore the mems device is connected to microcontroller because the output is to show the message in LCD, through GSM the message are going to be send to relatives, doctor & nurse.

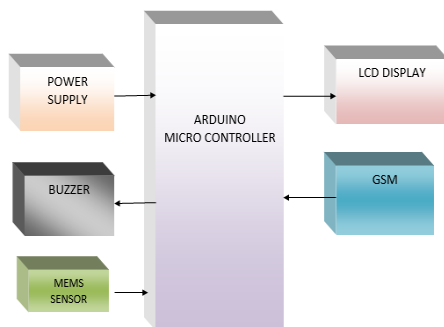


Fig.1. block diagram of gsm & displaying the output

Also in fig.3. MEGA 328P processor is employed those two flex device is connected to microcontroller we tend to square measure victimisation two arduous as a result of to not collide the values.

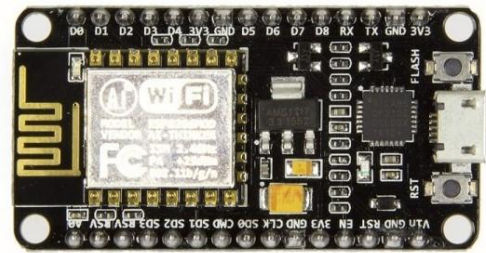


Fig.2. low-cost WIFI microchip

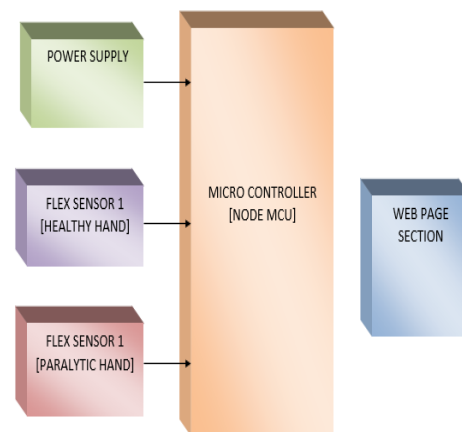


Fig.3. block diagram of flexible sensor & displaying in web page

S.No	HEALTHY HAND SENSOR	PARALYTIC HAND SENSOR	MUSCLE CONTRACTION SENSOR	DATE	TIME
1	0	1	100	2018-02-26	04:37:19pm
2	0	1	100	2018-02-26	04:37:19pm
3	0	1	100	2018-02-26	04:37:17pm
4	0	1	100	2018-02-26	04:37:16pm
5	0	0	0	2018-02-26	04:37:15pm
6	0	0	47	2018-02-26	04:37:14pm
7	0	1	100	2018-02-26	04:37:13pm
8	0	1	100	2018-02-26	04:37:11pm
9	0	0	52	2018-02-26	04:37:10pm
10	0	1	0	2018-02-26	04:37:10pm

Table.1. values displayed in web page

Through WIFI microchip as shown in fig.2. All values of electromyogram device and flex device square measure displayed in web content, and that we will monitor the paralytic patient daily in flex device one is for healthy hand and different is paralytic hand, we tend to square measure victimisation digital type for flex device and for

electromyogram device we tend to square measure victimisation analog values as shown in table.1.

Flex sensor

The Flex device may be a distinctive part that changes resistance once bent. An inflexed device incorporates a nominal resistance of 10,000 ohms (10 K). Because the flex device is in fig.4 bent the resistance step by step will increase. Once the device is bent at ninety degrees its resistance can vary between 30-40 K ohms. [2]The Flex device may be a distinctive part that changes resistance once bent. An inflexed device incorporates a nominal resistance of 10,000 ohms (10 K). Because the flex device is bent the resistance step by step will increase. Once the device is bent at ninety degrees its resistance can vary between 30-40 K ohms. The device measures 1/4 in. wide, four 1/2 inches long and is just .019 inches thick.



Fig.4. image of flex sensor

MEMS sensor

Microelectromechanical systems is that the technology of magnifier devices, significantly these with moving components. It merges at the Nano scale into nanoelectromechanical systems and Nano-technology.[3] Mems square measure created of parts between one and a hundred micrometres in size, and MEMS devices usually direct size from twenty millimetre to a metric linear unit, though parts organized in arrays may be over a thousand mm². They typically comprises a central unit that processes information and several other parts that move with the environment like small sensors. As a result of the big extent to volume magnitude relation of MEMS, forces created by close electromagnetism and fluid dynamics square measure a lot of necessary style concerns than with larger scale mechanical devices. MEMS technology is distinguished from molecular engineering science or molecular natural philosophy in this the latter should additionally take into account surface chemistry. Mems device is employed to convey the patient message by displaying and by causation sms initial we've given three directions, one for food is required and therefore the different is health problems, final one for emergency.



Fig.5. MEMS sensor

EMG SENSOR

Electromyography is an electro diagnostic medication technique for evaluating and recording the electrical activity created by skeletal muscles. electromyogram is performed victimisation AN instrument referred to as AN diagnostic procedure to supply a record referred to as myogram.as shown in table one what proportion muscle is active. A diagnostic procedure detects the electrical potential generated by muscle cells once these cells square measure electrically or neurologically activated. Those 3 pins as shown in fig.6 ought to be stickered to paralytic hand in order that reading are going to be noted on web content.

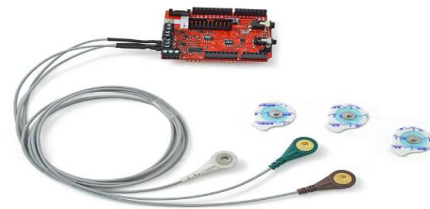


Fig.6. EMG sensor

Conclusion

In this paper, we tend to planned a triple-crown implementation of a system that helps disabled person in displaying a message over the LCD by simply easy motion of any a part of his body that has motion skills. This technique additionally takes care of true whereby nobody is gift to attend the patient and therefore causation a message through GSM of what he desires to convey in SMS. Our planned system works by reading the lean direction of the user half. The microcontroller currently displays the associated message on the LCD screen. It additionally sounds a buzzer in conjunction with message as presently because it receives motion signal from the measuring system.

Future scope and improvements

As of currently it's enforced for manual tilting of mems sensor however in future it may be done automatic. The delay may be overcome, also to increase the efficiency and to reduce the power consumption. According to the availability of sensor or development in biomedical trend more parameters can be sensed and monitored which will drastically improve the efficiency of the wireless monitoring system in biomedical field. Project is based on single hand, it can be implemented for both paralytic hands of the person.

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