

## Teleassertive Health Care System Using Arduino Uno

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**Abstract:** This paper mainly proposes a system that to monitor the health parameters with values and to get quick response for the patient from the hospital for the input sensors. The sensors used in these work are the heat sensor, finger heart beat sensor, pressure sensor and accerlometer sensor[1]. Whenever there is sudden increase in the parameters, the message sent to the hospitals by the module of global system for mobile communication. Now a days immediate signas, accuracy is much needed for any type of health care systems. The values that are obtained by the sensors are evaluated by the patient microcontroller platform and if there is any irregularity in the values, GSM send message to the hospital number and from there the patient get emergency aid for the abnormal of health.

**Keywords:** Heart beat finger sensor, accerlometer sensor, global system for mobile communication, accuracy, emergency aid

### Introduction:

Now a days testing and documenting has become common for various patient in both hospitals and also in outside laboratories. The premise behind this project is to design a system that uses Internet access to record the person's body at any moment. The purpose of these framework is to measure certain biological sensing variables by using the required sensor to know the human health condition and send sms to the GSM module[1]. The data of the victim can be stored at database and these data can be viewd by doctors in his smart devices, even the doctor is in outside of the hospital. Here in these work GSM module is used for sending and receiving the messages from the hospital to the location of the patient and vice versa. The functioning system thus has low variance, good battery life and extremely compact for patient medical tracking. In recent times, smart and attached health care is extremely important wide array of implementations enabled by the GSM module. Integrated sensors, whether mounted on the body or installed in to the living environments of the patient so that the neighbours can collect the information about the health status of patient and quality of life of patient based on the data. These process computes the values of the victim and if there is any sudden increase in the values of health beyond critical values, then the registered mobile number gets an alert message to take the emergency of patient. For these model, here using Arduino microcontroller that is interfaced with the LCD display and to the biomedical sensors.

The heart rate can be functioned based on the truth that blood circulates to each of heart rate by using IR led. The heart beat per minute can be calculated by the microcontroller

based on the blood circulation per second. Microcontroller takes the input sensor values from the body of patient by the sensors attached to the victim body in a band like structure to know the values of the medical condition. This system will automatically carry the specialist to the medical site by directing the doctor to detect critical biological signals and a still picture of the client from the emergency side; make it diagnose the patient correctly and then guide the medical criteria or technicians on how to treat the patient, help him find simple yet correct locations for caring for patients until he reaches the clinic.

Now Wireless Sensor Networks (WSN) recently play a vital role in science, leading in the growth of different experience-performance smart sensing systems. Health monitoring is a voluntary, non-statutory tool to assess our workers for ill health effects, including lower back pain. That form of environmental health monitoring system will allow us as an employer to be mindful of health problems and to respond in time to prevent problems caused or exacerbated by work. An other major role for remote monitoring is to provide insight into a program that examines internal control measures. There are also specific rules pertaining to automatic care and full body shaking in the work. In order to achieve that we meet our responsibilities under these guidelines, we will refer to guidelines on HSE (Health System Engineering) if automatic care or whole person shaking is a concern in our work.

#### **Literature survey:**

Yena Kim et al [2] proposes a system that the improvement of telemonitoring by means of remote body territory systems is an developing course in customized medication and locally established portable wellbeing. A WBAN comprises of little, wise clinical sensors which gather

physiological parameters , for example ECG, EEG and pulse. The recorded signals are sent to an organized by means of remote advancements, and are then transmitted to a human services checking focus. One of the most broadly utilized remote advancements in WBANs is zigbee since it is focused at applications that require a low information rate and long battery life. In any case, ZigBee-based WBANs face serious impedance issues within the sight of WiFi systems.

This issue is brought about by the way that most ZigBee channels cover with WiFi channels, seriously influencing the capacity of human services observing frameworks to ensure dependable conveyance of physiological signs.

Mohammad M. Masud et al [3] proposes a system that mainly observing the health condition only for the heart rate by visiting ECG and records the data. Be that as it may, these gadgets are vitality mindful, have restricted figuring assets, also, might lose arrange network. Right now, propose a portable observing answer for adapt with these difficulties by settling on the fly assets accessibility, battery level, and system discontinuity. All together to take care of this issue, first we isolate the entire procedure into a few subtasks to such an extent that each subtask can be executed consecutively either in the server or in the versatile or in equal in the two gadgets. At that point he built up a scientific model that considers all the imperatives and finds a dynamic programming answer for get the best

execution way for the problem.

Ebrahim Al Alkeem et al [4] proposes a system that Current social insurance administrations are serving patients needs by utilizing new innovations, for example, wearable gadgets or on the other hand haze of things. The new innovation gives more offices and upgrades to the current social insurance administrations as it permits greater adaptability as far as checking patients records and remotely associating with the patients by means of cloud of things. Albeit a portion of the security issues were tended to by certain scientists in the writing, they for the most part tended to haze of things security or human services security independently what's more, their work despite everything experiences restricted security assurance what's more, vulnerabilities to some security assaults. The proposed new medicinal services framework consolidates security of both social insurance what's more, haze of things innovations.

Mirza Mansoor Baig et al [5] proposes a system that Wellbeing observing frameworks have quickly advanced during the previous two decades and can possibly change the manner in which social insurance is right now conveyed. Albeit brilliant wellbeing observing frameworks computerize persistent checking undertakings and, accordingly improve the patient work process the board. This paper shows a survey of savvy wellbeing checking frameworks and a diagram of their plan and displaying. Moreover clinical worthiness, systems and proposals on improving current wellbeing checking frameworks will be displayed. The primary point is to audit current best in class observing frameworks and to perform broad and a top to bottom investigation of the discoveries in the region of savvy wellbeing observing frameworks.

S. M. Riazul Islam et al [6] proposes a system that The Internet of Things (IoT) makes keen articles a definitive structure obstructs in the advancement of digital physical savvy unavoidable structures. The IoT has an assortment of utilization areas, counting social insurance. This paper studies propels in IoT-based social insurance advancements and surveys the best in class arrange models/stages, applications, and modern patterns in IoT-based human services arrangements. Likewise, this paper breaks down assault scientific categorizations from the human services viewpoint. Further, this paper proposes a wise communitarian security model to limit security chance; talks about how unique developments, for example, huge information, encompassing insight, and wearables can be utilized in a medicinal services setting.

Afef Mdhaffar et al [7] proposes a system that it is mainly working on the health parameters like blood pressure, glucose and temperature for areas where there is low internet connection is low for rural areas. It is a new IoT-based health monitoring approach to collect data and sent to an analysis module via low-cost, low- power and secure communication links LoRaWAN network infrastructure . The main objective is to provide the health facilities who are not able to get treatment for long time and with low communication cost. Several experiments have been conducted to evaluate the area covered by the LoRa network and the power consumption of our system.

## ARCHITECTURE AND IMPLEMENTATIONS:

This section gives the overview and structure of the proposed framework and the interconnection connections among the framework squares.

Fundamentally, the proposed framework intends to cover a start to finish savvy wellbeing application that can be develop from two useful structure squares. Anyway the principle capacity of the first building square is to accumulate every tangible data that are identified with the observed people, while the subsequent square capacities are to store, procedure and present the came about data of this phase to the specialistsare following the instance of the checked individual. which shows the general model, where the heart rate of the patient is observed and recorded in the Arduino and send the signals to the doctors or neighbours through the GSM module.

### A. Smart Embedded Board(SEB)

This subsection gives the equipment parts that are used to create a shrewd board connected to the human body. Occasionally, the board detects the human wellbeing conditions utilizing a few committed sensor gadgets and afterward the wide passes on the crude detected information to the back-end server application utilizing GSM SMS.

### Microcontroller:

As shown in fig(1), it is the center piece of the SEB structure; the microcontroller goes about as the mind of the keen board that is holding the principle board flow diagram. Be that as it may, there are numerous microcontrollers accessible in advertise and can perform well the primary board rationale, for example, PIC and Arduino. Arduino Uno as delineated in this board depends on ATmega32 microcontroller, which has a lot of 14 information advanced pins, where 6 outof 14 can be utilized as a PWM yield pins, likewise, the microcontroller board has 6 simple data sources, a fired full of 16 MHz, a USB interface, a DC power jackand reset catch. The USB interface, simplifies the association of the microcontroller with the PC, additionally the USB can be a force provider for the microcontrollerboard as shown in fig1.

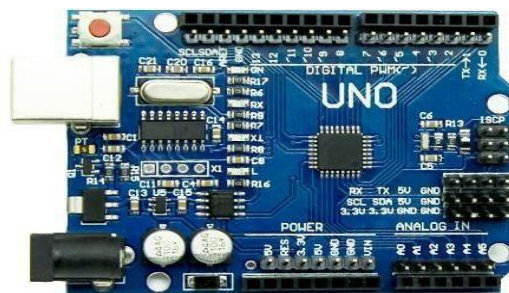


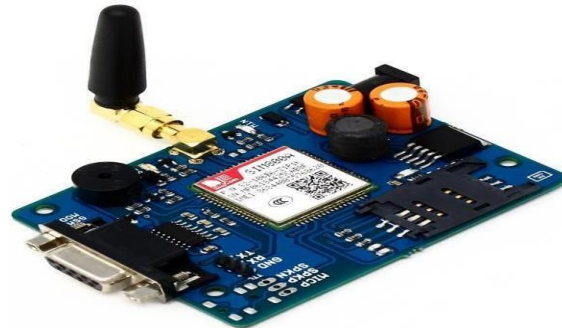
Fig 1:Arduino Uno microcontroller

### GSMMODULE:

As shown in fig(2), this is a GSM shield from DFRobot as delineated is a Quadband GSM motor that takes a shot at frequencies EGSM 900MHz/DCS 1800MHz and GSM850 MHz/PCS 1900MHz. Sending messages by means of GSM organize controlled

by means of AT directions GSM07.07, 7:05 and SIMCOM improved AT Commands. The structure of the shield permits driving the GSM work legitimately with any PC and Arduino board.

Fig 2: Gsm Module



#### **B. Online-Web Based Monitoring Application:**

Specialists and Nurses are given a basic online application to check the patient's wellbeing conditions. The executed web application is available through a standard internet browser, advanced cell. The REST (RESTful) programming design style has been adjusted to protect the web application i.e versatile and flexible.

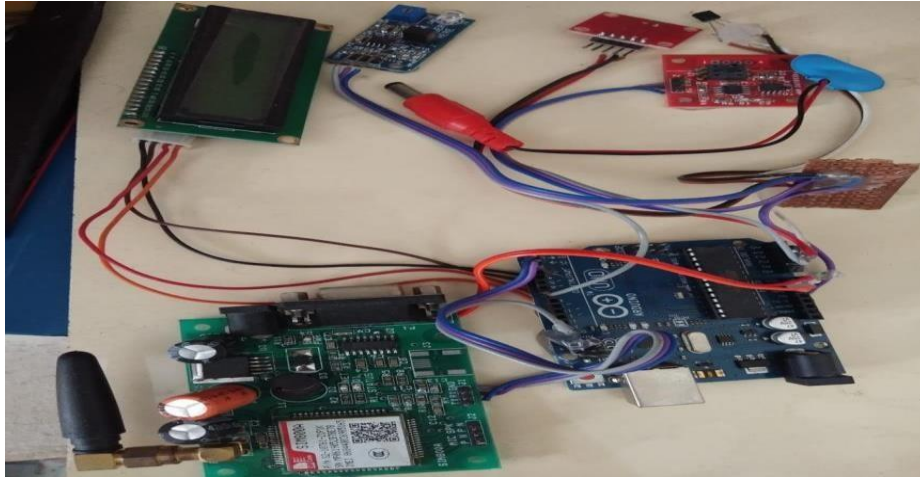
The front-end speaks to the page which is open by the Doctors and Nurses. This part utilizes a few web advancements, for example HTML5, CSS etc.. Be that as it may, a bidirectional information correspondence channel is kept up between this tire and the center tire through the Asynchronous JavaScript AJAX innovation. The final website page is responsive and is running on advanced mobile phones, tablet gadgets and standard PCs. PHP programming is used for the middle tire, which hosts the main server logic has been developed using PHP programming language and this logic has been deployed on an Apache webserver.

The back-end tire which hosts the MySQL database server and this database is used to store all the patient data, system user like doctors, patients and nurses. By using these relational database structure the design of the module is formed.. However, health data records and patients' positioning information are time stamped using the standard UTC referencetime.

In a RESTful programming building style everything is an asset and for every asset there is a URI (Universal Resource Identifier) that speaks to the comparing asset extraordinary location. In addition, there are four action words that are usable to move and control any asset portrayal. At long last, the word CRUD alludes to these four action words and the C letter is originating from make, R from read, U from update and D from erase.

## RESULTS:

As shown in fig(3), the result of the work is to monitor the health conditions of patient when it rises more than the optimum values. Where the values of the sensors are seen in the LCD for the temperature sensor, blood pressure, pulse rate. This is shown in the figure 3 to monitor the health conditions of the patient.



**FIG 3: Monitor health conditions of different sensors**



**FIG 4: SMS to the doctors by GSM module**

As shown in the fig(4), when the health condition reaches to the maximum value which is instructed in the code. When it rises above normal values the GSM module send signals to the doctors so that the doctors can have a possibility to provide first aid to the patient and later the patient can go to hospital. This will lead the patient to be in safe condition and get the better treatment at the hospital.

## CONCLUSION:

Smart systems are designed to deliver innovative medical treatments at a time when the health care system should be easy, low power consumption and important fields to be created and improved by health care. The program has been innovative and to increase the quality of health care services and minimize cost and ensuring that those in need of urgent treatment get it sooner. It is a device that can measure the parameters and transmits the medical reports to doctors using gsm to rescue the patients with potential in the future to add other factors for measurements according to the sensor available in the market.

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