REAL TIME MONITORING AND ALERT SYSTEM OF HUMAN HEALTH USING BIO SENSORS, GSM and GPS

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Abstract- **This proposed system aims on treatment to patients who suffer from sudden illness like heart attack and no one is there along with them to save them. Previous works have cited only monitoring of the human health using only bio-sensor and providing them information of their health periodically. This system goes a step ahead of it. Bio-Sensors are used to monitor any abnormal change in the health of a person. If it senses any change, through a GSM interactive module it sends a message to a nearby hospital or health Centre .With the help of GPS we can locate the location of the victim.**

Index Terms- blood flow rate, CC2500, troponin, shortest path, NFC.

I .INTRODUCTION

Technology development can be considered as day to day inflation. Even though there are advancements in technology, the major role played by technology is in the field of medicine. Today's world is prone to various types of diseases which can be cured with the available equipment in an accurate manner. Deadly diseases like cancer too has a solution like it can be treated by radiation method. When the person is diagnosed with any disease the victim gets admitted in a hospital and treated. But nowadays, people suffer from sudden heart attack and other dreadful diseases. The most painful thing is that they are prone to these when they are alone. This proposed system may give a solution to this problem. One of the finest inventions by human among various sensors is Bio-Sensors. A Bio-Sensor is a type of sensor which monitors any abnormal change in our body such as change in heart beat rate etc. When it analyzes any abnormal change it alerts the GSM module. The GSM module sends the information. The message is sent to a nearby hospital or Health Centre.

The additional feature about this system is that a GPS module is included here to know the exact location where the victim is.

II. DESIGN OF THE SYSTEM

The proposed system is basically an embedded system. Hence a microcontroller is used here to take the necessary actions

2.1. BIO-SENSORS

Bio-Sensors are analytical devices which converts a biological response to an electrical signal. Here the biological response is nothing but any abnormal change in the heart beat rate of human body. Researchers say that a person before getting a severe cardiac attack, the flow rate of blood decreases cardiac tissue deadens, cells release natural chemicals, such as troponins. Implanted biosensors as shown in figure 1 may be used effectively to sense the release of troponin. Another type of biosensor shown in figure 2 is used to measure only the blood rate flowing. It is also evident that measuring the flow of blood rate is enough to indicate the cardiac attack. But by using implanted biosensor better results are obtained. The working model of biosensor is shown in figure 3.

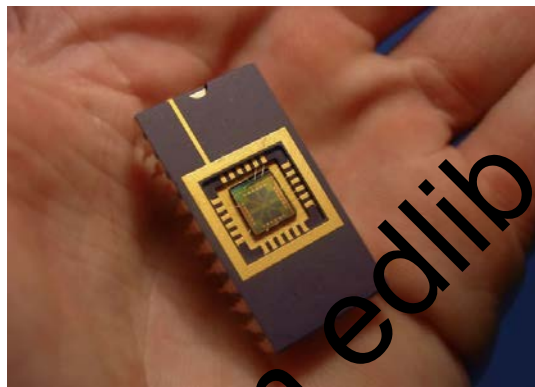The electrical signal retrieved will be sent for further processing.

Figure 1: Bio-Sensor
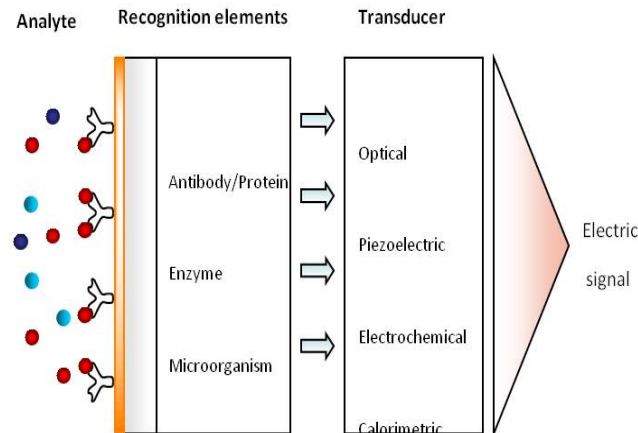

Figure 2: A Biosensor attached to the Human Body

Figure 3: Working of Bio-Sensor

2.2 GSM MODULE

The GSM Module used here is the familiar SimCom SIM900 module. Since most of the devices for communication use this module. This will be more compatible for our project. The module is shown in figure 4.
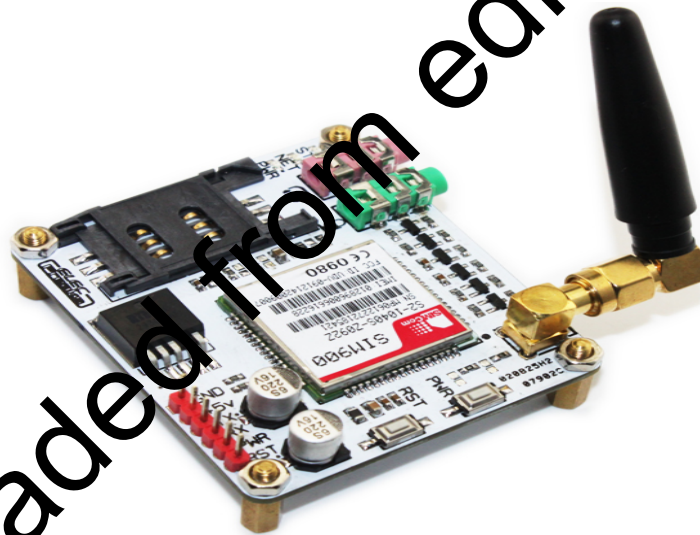

Figure 4: GSM Module

2.3. GPS MODULE

GPS also known as "Global Positioning System" is used to locate the exact destination of an object. It tracks the latitude and longitude to find the body. It is a satellite based tracking device. The reason for using this device is that it can be helpful for zeroing the location of the victim and to send the information about the location along with data to a hospital or Health Centre. The main function of the GPS in this project is that it sends the distance of various hospitals from the victim's current location. The GPS module is also interfaced with the microcontroller. For reliability we choose GPS Module-Parallax PMB-648 as shown in figure 5. [5].
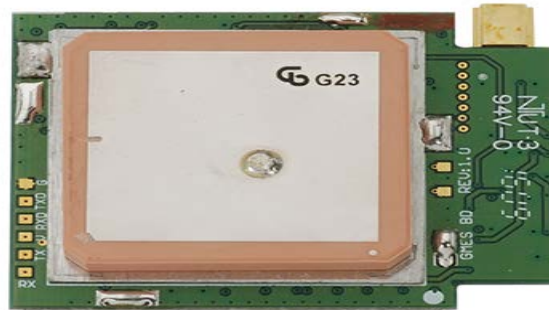
Figure 5: GPS Module- Parallax PMB-648

2.4. MICROCONTROLLER

The whole system of this project is controlled by the microcontroller. The microcontroller is the heart of the system. The GSM module is activated only when the microcontroller gets the electric output from the bio-sensor. It co-ordinates the work performed by the various modules present in the system. The Micro-Controller performs the operation of selecting the near-by hospital from the information provided by the GPS module. Here the compatible microcontroller system for our project is Arduino Mega 2560[4].

Figure 6: Arduino Mega 2560 Micro Controller Board

2.5. RF TRANSMITTER AND RECIEVER

It doesn't look pleasing if there is a wired connection from the biosensor to the module. Hence to avoid that an RF transceiver which works on RF frequency 2.4GHz is used. To satisfy this requirement RF transceiver CC2500 is used and as shown in figure 7.
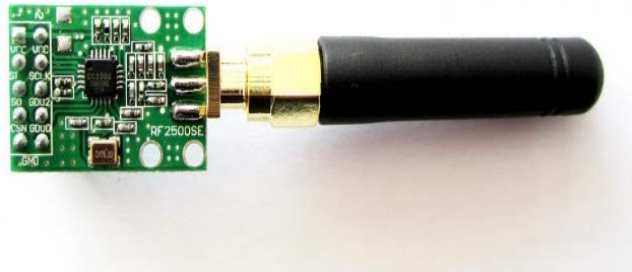
Figure 7: RF transceiver CC2500

III. IMPLEMENATATION OF THE SYSTEM

A Bio-Sensor is attached to the body of a person. This bio sensor monitors the health of the human being. Furthermore the sensor is connected to the system which has microcontroller. The microcontroller operates the GSM module and GPS module. A separate power source is required to operate these modules.

As per the definition, bio-sensor is nothing but a transducer. When there is any change in the blood circulation, it affects the inner part of the bio-sensor, thus it produces an electrical output. The electrical output is a trigger for the microcontroller to activate the GSM module and GPS module. The electrical output is sent to a RF receiver in the module through a RF transmitter connected to the output of the biosensor. The program is fed to the microcontroller such that the location tracked by the GPS module is also sent as a message to the station.

The working of the system is explained as follows:

- The Bio-Sensor senses for any antibody enzymes, proteins and microorganisms. When a person suffers from sudden cardiac attack or any other respiratory problem, the bio-sensor senses the abnormal change. This produces an electrical output from the bio-sensor.

- The generated electrical signal is given to the microcontroller. The microcontroller is fed with a program such that various attacks such as cardiac attack or respiratory problems are assigned with a value and a message is generated within it according to the electrical signal

The generated message is transmitted wirelessly through a GSM module. The GSM module sends the information to a nearby hospital or health Centre from the data from the GPS.

- To know the exact location of the victim, the GPS module provides the exact location and also the distance of the available hospitals or health cares from the victim's location .That message is also sent to the

microcontroller. The microcontroller decides the shortest path and in the program fed to it a timer is set and if the force doesn't arrive, it sends the message to the next shortest path. The microcontroller sends the command to the GSM module to send the message.
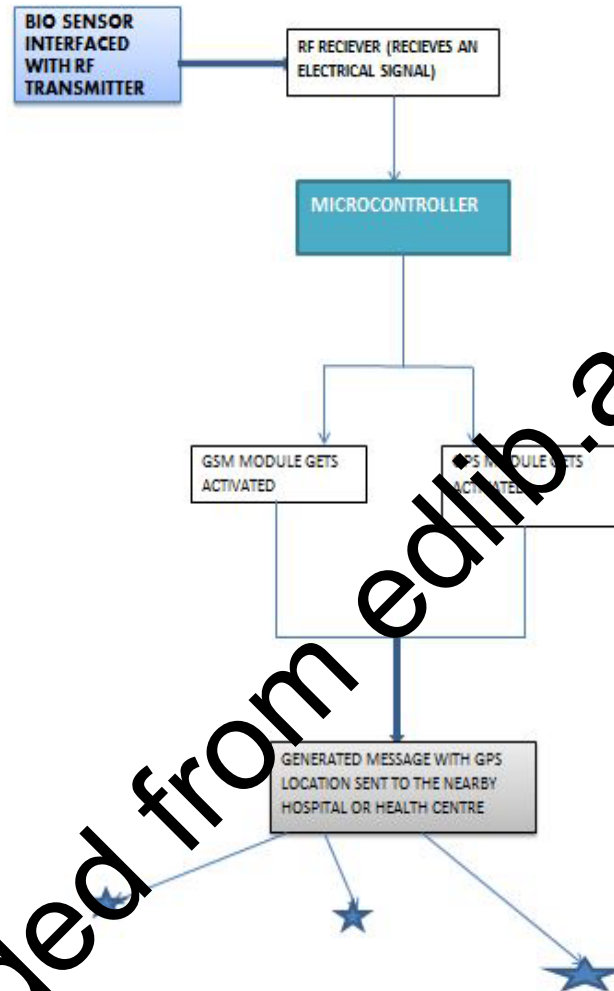
Figure 8: Block diagram for Working of the system

CONCLUSION

Sudden cardiac attacks are unpredictable. Even though after these kinds of attacks there are chances of surviving if immediate primary treatment is given. This can be accomplished by this project. The cost of this proposed system is not much more than a life costs. The patient without any hesitation can carry along with him this module because; it serves as a guardian when they are alone.

FUTURE WORKS

This system can be extended by developing an android app by using the latest Near Field Communication (NFC) technology which is more compatible for smart phones. Hence, a separate module is not required for this entire process to happen.

ACKNOWLEDGMENT

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