

# Mobile Application for Driver Health Status Remote Monitoring

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## Abstract:

This project aims in design and present the health parameters monitoring and recognition based coma, paralysis patient's posture information can be gathered difficult. So, By using this project Non vision based different wearable type sensors(3-axis accelerometer, heartbeat,) added and located at patient body for getting the postures information and activity by them always displayed on computer by using Zigbee-WSN technology. Doctors using this information give treatment to the patients in correct time. The patient monitoring portfolio spans environments, patient's acuity levels, and clinical requirements. Versatile Sure Signs patient monitors offer a range of options for flexible care, including a portable beside monitor, compact patient monitor, and vital signs monitor. All patient monitors are designed to give caregivers a clear view of patient information. We present the design and implementation of a Remote Patient Monitoring (RPM) system based on wireless technology using a cellular phone, to send an SMS (Short Message Service) to the medical staff the most useful thing to know about the global system for mobile communication is that it is an international standard. If user travels in parts of world, GSM is only type of cellular service available. Instead of analog services, GSM was developed as a digital system using TDMA technology.

## Keywords:

Remote Patient Monitoring (RPM) system.

## 1. Introduction:

The goal of the proposed system is to develop a system, which uses mobile technology that keeps control of the various appliances. The patients in the ICU need a constant monitoring of their temperature and heart beat. And send the message to that particular responsible person and also giving alert to the patient through message display. The proposed system is a working model, which incorporates sensors to measure

important parameters namely the temperature, MEMS accelerometer sensor position of patient, saline level, pressure sensor of oxygen cylinder level and heart beat sensor. The sensors are interfaced to computer, so that the condition of a patient can be analyzed by doctors in any part of the hospital wherever they are. 3-axis accelerometer sensors are located on the body. The parameters that determine its position are 3 rotational angles  $\theta$ , which are defined as the angle between the gravity and x-y-z plane and that between the projections to the gravity. When they are put into operation, 3D, i.e. x-, y-, and z-axis, acceleration sensors are output continuously. Heart beat sensor is used to measure heart rate of the patient and Temperature sensor for measuring the temperature of the patient. The transmitter section of the system consists of an ARM Micro controller, which is interfaced with the 3-axis accelerometer, clip type heart beat sensor, temperature sensor pressure sensor, as input and GSM, Buzzer, LCD output modules, the controller acts as an intermediate medium between both of them. So the controller can be termed as a controller. These sensors are arranged on patient's body to getting posture information. GSM modem sends SMS messages data received from the controller. The corresponding data also displayed on LCD.

## II. LITERATURE SURVEY:

### 1. Advanced Vehicle Tracking System on Google Earth Using GPS and GSM

In this paper GPS based vehicle tracking/navigation system is implemented. This is done by fetching the information of the vehicle like location, distance, etc. by using GPS and GSM. The information can be transformed with the following features: The information of the vehicle like location, etc. is obtained after every specified time interval defined by the user. Then this periodic information of location is transmitted to monitoring or tracking server. This transmitted information is displayed on the display unit by using the google earth to display vehicle location in the electronic google maps.

**2. Vehicle tracking and accident warning System using GPS and its implementation in FPGA:**

In this paper also the location of the vehicle is determined by using the Global Positioning System. The information from the GPS receiver is sent in the form of SMS to the user with the help of GSM. Once this SMS is received from the user, a response type of message is sent to the owner of the vehicle through the GSM modem. A sensor which is named as accelerometer sensor is then used to detect any kind of mishaps or accidents happened with the vehicle also it will trigger some kind of signal in case of any mishappenings. Unlike the microcontroller used in many system this system also uses a FPGA Spartan processor is used which manages all the parts responsible in system as according to the program done.

**3. GSM & GPS based tracking system:**

This system is helpful for public transport vehicles such as buses and taxis, it provides Tele monitoring and management system for the transportation of the taxis and buses within the city. In this paper the system mentioned consists of an —On- board module which is mounted in the vehicle which is to be tracked. This on-board module consists of Global Positioning System, a GSM modem and ARM processor. The navigation message which is broadcasted by the GPS position satellite is received and resolved by the GPS receiver of the vehicle terminal. This satellite computes the longitudes and latitudes of vehicle coordinates, then transform it into the short message form by using GSM communication controller and this message is sent to the monitoring center through the GSM network.

**4. Design and development of GPS-GSM based Tracking system with google map based Monitoring:**

This system uses Global Positioning System (GPS) which is used to receive the coordinates of latitude and longitude form the satellite during the critical information. We all know that tracking system is now-a-days a very important in modern world. This system can be used in the monitoring of soldiers, also in tracking the theft of the vehicle and in many more other applications. This system uses microcontroller, Global Positioning System (GPS) and Global System for Mobile Communication (GSM). This system uses only one GPS device and GSM enable a two way communication process. GSM modem is provide with a SIM card which uses the same and regular communication process as we are using in regular phone.

**5. GSM and GPS based vehicle location and tracking System**

This paper uses to a RF transmitted; the RF transmitter is attached with the vehicle which consists of its own identification. The data which will be continuously transmitting to the RF receiver is connected to the microcontroller. The GPS will receive the location of the vehicle and will transmit this data to the microcontroller. Supposedly the RF transmitter is not receiving the signal from the RF transmitter then the receiving unit triggers a signal to the microcontroller, and from this signal we can identify the theft. If it is identified that the vehicle is theft then it automatically sends location of the vehicle to its user as the owner of the vehicle receives the information in the form of SMS through the GSM modem. This system is much simpler and cost effective than the others. The vehicle is automatically stopped if a password like SMS sent by the user.

**III. IMPLEMENTATION:**

The proposed portable system which captures the images and text written which are placed in front of the camera can be read out or announced out using speakers. These details were verified using Raspberry Pi processor for authentication and alerts visually impaired or blind person through voice messages using speakers or head phones.

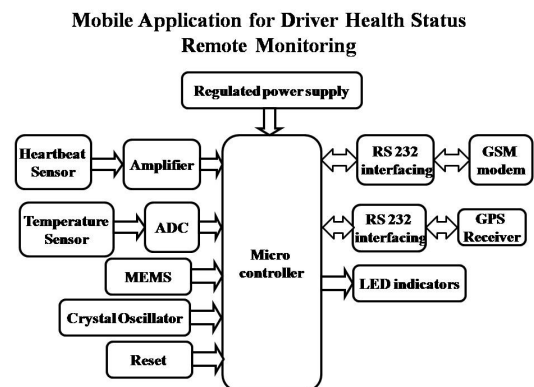


Figure:-1. Block diagram of proposed system

The objectives of the project are:

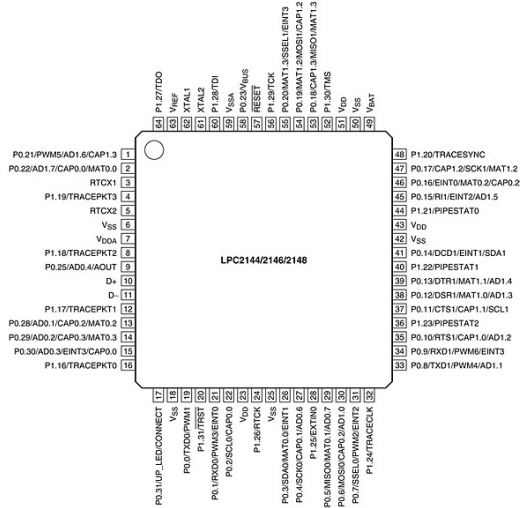
- 1.Real time monitoring of health status of a person (coma, paralysis persons).
- 2.wireless communication using GSM modem
- 3.Long life
- 4.Highly sensitive wireless interface
- 5.Easy to install
- 6.Low power consumption.

**IV. RELATED WORK:**

The brief introduction of different modules used in this project is discussed below:

**a. ARM7:**

ARM LPC2148 is a 64 pin Micro Controller which comes under ARM 7 version of ARM processors. It comes under the processor core architecture ARM7TDMI-S. It is a 32 bit Micro Controller. This is intended for high end applications involving complex computations. It follows the enhanced RISC architecture. It has high performance and very low power consumption. It has serial communications interfaces ranging from a USB 2.0 Full Speed device, multiple UARTS, SPI, and I2Cs. Various 32-bit timers, dual 10-bit ADC(s), single 10-bit DAC, PWM channels and 45 fast GPIO lines with 9 interrupt pins.



**b. LM 35: (TEMPERATURE /FIRE SENSOR):**

The LM35 sensor series are precision integrated-circuit temperature sensors, whose output voltage is linearly proportional to the Celsius (Centigrade) temperature. To detect the heat produced during fire occurrence we use temperature sensor.

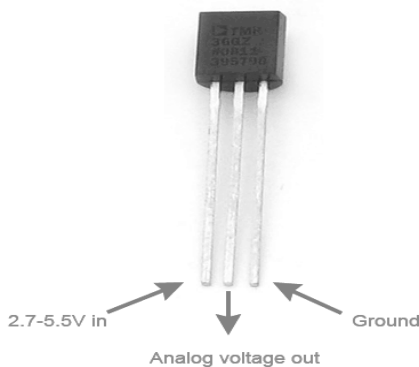


Figure 3.19: Temperature Sensor

The Temperature Sensor LM35 sensor series are precision integrated-circuit temperature sensors, whose output voltage is linearly proportional to the Celsius (Centigrade) temperature.

**c) Heart Beat Sensor:**

This heart beat sensor is designed to give digital output of heart beat when a finger is placed inside it. When the heart detector is working, the top-most LED flashes in unison with each heart beat. This digital output can be connected to microcontroller directly to measure the Beats Per Minute (BPM) rate. It works on the principle of light modulation by blood flow through finger at each pulse.

**d) MEMS sensor MMA 7260 Q:**

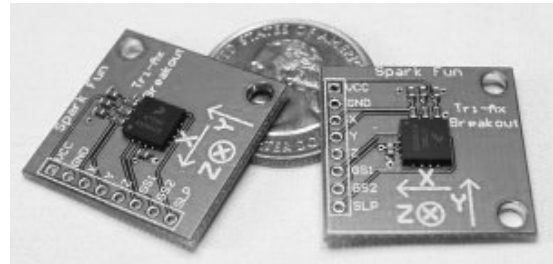


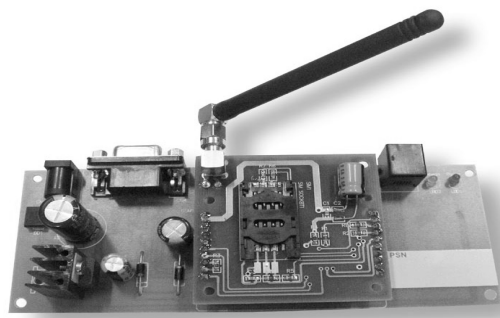
Figure 3.26: MEMS sensor MMA7260Q

The MMA7260Q is 3-axis accelerometer. An accelerometer measures acceleration (change in speed) of anything that it's mounted on. Single axis accelerometers measure acceleration in only one direction. Dual-axis accelerometers are the most common measure acceleration in two directions, perpendicular to each other. Three-axis accelerometers measure acceleration in three directions.

**e) Global System for Mobile Communication (GSM)**

**Definition:**

GSM, which stands for Global System for Mobile communications, reigns (important) as the world's most widely used cell phone technology. Cell phones use a cell phone service carrier's GSM network by searching for cell phone towers in the nearby area. Global system for mobile communication (GSM) is a globally accepted standard for digital cellular communication. GSM is the name of a standardization group established in 1982 to create a common European mobile telephone standard that would formulate specifications for a pan-European mobile cellular radio system operating at 900 MHz. It is estimated that many countries outside of Europe will join the GSM partnership.



**f) GPS:**

A GPS receiver calculates its position by precisely timing the signals sent by the GPS satellites high above the Earth. Each satellite continually transmits messages which include

- The time the message was transmitted
- Precise orbital information (the ephemeris)
- The general system health and rough orbits of all GPS satellites (the almanac).

**IV CONCLUSION:**

The existing model presents an Integrating feature of all the hardware components which has been used and developed in it with Arm7. The Presence of each and every module has been reasoned out and placed very carefully. Hence the contributing to the best working unit for Mobile Application for Driver Health Status Remote Monitoring has been designed perfectly. Secondly, using highly advanced IC's like ARM7 processor, with the help of growing technology, the project has been successfully implemented with a unique idea. Thus the project has been successfully designed and tested.

Our project "Mobile Application for Driver Health Status Remote Monitoring" is mainly intended to design a novel wearable system with the interactive posture caption and recognition functions based on the Non-vision over the GSM modem which is very useful for handicapped and paralyzed persons. The system consists of sensors like temperature, heartbeat, MEMS accelerometer sensors, IR obstacle sensor, Pressure sensor and a LCD interfaced to the Arm-7 LPC2148 micro controller. The project also uses a heart beat sensor for continuous monitoring of the heart rate, which can be designed such that alarm horns if the heart level goes beyond set level. The project is also extended using GSM modem which alerts the health status of the patient directly to the doctor in form of SMS messages and even at emergency situations. The system can also be extended using GPRS module which can send the data directly to the predefined weblink.

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