

## A Review Paper on Design of GPS and GSM Based Intelligent Ambulance Monitoring

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### ABSTRACT

Proposed paper presents design of such a monitoring system for emergency patient transportation employing ARM 7 processor module. The system will be useful for monitoring ambulance location using Google map. It also include biomedical sensors to monitor heart bit rate and temperature of patient through SMS. The front end application at the monitoring system is developed using visual basic software in Personal Computers. It can display location of ambulance and status of heart bit rate and temperature of patient. After receiving SMS hospital can prepare their staff for proper treatment of coming patient.

**Keywords**-ARM7processor module, Biomedical sensors, 89C51 Microcontroller.

### I. INTRODUCTION

Immediate medical attention to critically ill patients and accident victims followed by transportation to a well-equipped medical facility within the golden hour saves many lives. The ambulances are specially designed to carry emergency drugs and instruments. The ambulance houses emergency medicines, sterilizer, stretcher, and so forth. The paramedics that accompany the ambulances are specially trained to be emergency technicians. There exists a need to augment the skill set of such paramedics with the expert doctor's advice from the monitoring station (MS).

MS helps in coordinating with the medical personnel of that hospital. Hence there is a need for communication between the staff of the ambulance and the monitoring station. The doctor needs to understand the physical and physiological condition of the patient so that the right decision regarding administration of drugs and transport destination can be appropriately taken.

MS is base unit include the location of the vehicle .The usage separate GSM/GPRS modems, would be required. Hence an effective system will be developed that can acquire physiological data of patient and ambulance location data from a GPS receiver through a mobile smart message (SMS).

In ambulance the system called ambulance unit has been built around ARM 7 microcontroller based module exclusively designed for this purpose and integrated with commercially available GPS and GSM modules .The necessary software for the embedded system has been developed using KEIL compiler for ARM family of microcontrollers.

Ambulance unit also include biomedical sensors for acquiring physiological data of patient. The

sensors will monitor temperature and heart rate of patient travelling through ambulance.

An integrated GPS-GSM system is proposed to monitor ambulance using Google Earth application. At receiver side GPS accept data coming through SMS and process date using 89C51 .After data processing, Google Earth application is used to view the current location and status of each ambulance.

The front end application at the monitoring system is developed using visual basic software in Personal Computers. The system will found to be very useful for emergency patient transportation.

### II. PROBLEM STATEMENT

Presently different physiological data acquisition and transmission systems using cellular network and radio communication links, location monitoring systems and video transmission systems are also commercially available. The emergency patient transportation systems uniquely require transmission of data pertaining to status of patient's heart bit rate, temperature of patient and vehicle location information. These requirements are presently met by using separate communication systems for physiological data, and location that result in a lot of inconvenience to the technicians, maintenance related issues, in addition to being expensive.

The aim of paper is to design of GPS and GPRS based ambulance monitoring with patient health care system. It includes Ambulance system and Monitoring system. The ambulance system has built with ARM 7 microcontroller based module. The paper can monitor location of ambulance from Hospital using Google Earth application and integrated with commercially available GPS and GSM modules. With use of biomedical sensors it is possible to send heart bit rate and temperature of

patient to monitoring system during the travelling through SMS. Proposed paper uses visual basic software in PC at monitoring system. It can display location of ambulance and status of heart bit rate and temperature of patient. After receiving SMS hospital can prepare their staff for proper treatment of coming patient.

### III. METHODOLOGY

#### 3.1. HARDWARE:

Fig. 3.1 shows system architecture of proposed paper. Ambulance system and monitoring system can monitor location of

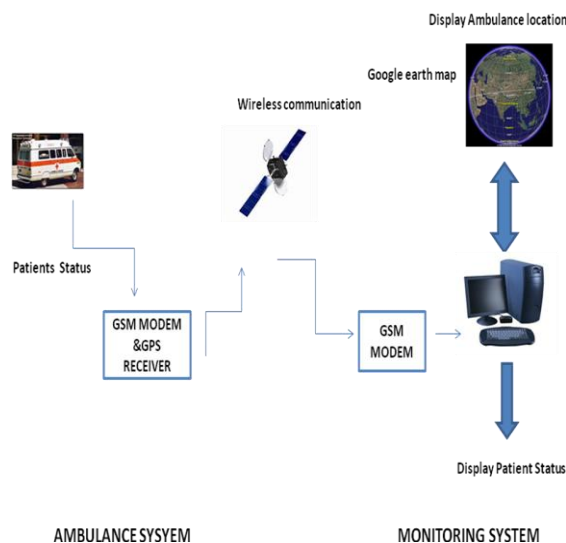


Fig. 3.1 system architecture

It also includes health care system for monitoring temperature and heart bit rate of patient. Monitoring system has pc uses Google map to display location of ambulance.

#### 3.2 AMBULANCE SYSTEM:-

Fig 6.2 shows the block diagram of proposed ambulance system that can be implemented on ARM 7. It can see from the diagram, it consists of biomedical sensors, GPS receiver, and GSM modem. The health statuses of patient obtain using a body temp sensor as well as heart rate sensor. These sensors will measure the body temperature and the heart rate of patient and will be stored in microcontroller memory. The heart bit and temperature can be sending through GSM modem

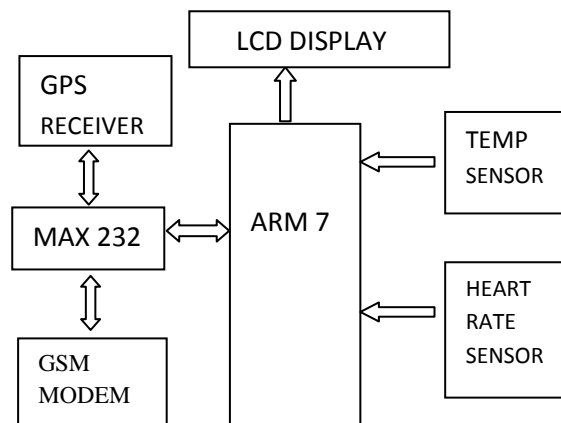


Fig. 6.2 Ambulance system

#### 3.3 MONITORING SYSTEM:

Fig. 6.3 shows block diagram of monitoring system. The system includes microcontroller 89C51, Personal computer PC, and GSM modem Message coming from ambulance system can be processed by microcontroller. Personal computer has visual basic software will display health status of patient and using Google earth can monitor location of ambulance.

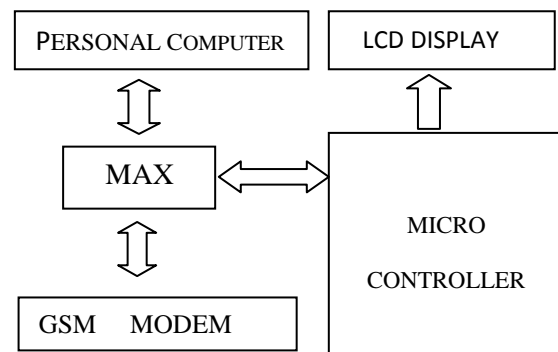


Fig. 6.3 Monitoring system

### IV. SOFTWARE

In monitoring system Visual basic software will be used in personal computer. Programmers can not only create simple GUI applications, but to also develop complex applications. Display windows are created using drag-and-drop techniques. Heart bit rate and temperature send by ambulance system can be display. Microcontroller 89C51 in monitoring system will be programmed using ASM 51 of assembly language. ARM 7 in ambulance system will be programmed using Keil UV3 of Embedded C programming.

### V. CONCLUSION

The paper can help to save a few critical minutes of response times by monitoring location of ambulance from Hospital. Proposed paper also includes biomedical sensors which gives heart bit rate and temperature of patient during the travelling in

ambulance through SMS. It uses Visual basic software at PC in monitoring system to display location of ambulance by using Google earth map and displaying SMS. After receiving SMS hospital can prepare their staff for proper treatment of coming patient.

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