Automatic RF Alert system to Avoid Vehicle Accident and Rescue using Wireless Control Techniques

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Abstract: Traffic overcrowding and in an urban areas traffic flow management were familiar as major problems, which have caused much thwarting for the ambulance. Moreover road accidents in the city have been continuous process , the more crucial process is protect the loss of life due to the accidents .The main theme behind this scheme is to provide a smooth flow for the ambulance to reach the hospitals in time and thus minifying the expiration . After the accident occurrence there will be intimation to the vehicles which around the accident spot. The ambulance is controlled by the central unit which provide short and traffic controlled route to reaching the hospital as early as based on the accident location. The accident spot is located through the sensor systems in the vehicle and sever guide the ambulance to reach the spot. Total processing is fully automated one.

Keywords: Intelligent traffic system, GPS, GSM RF Module.

I. INTRODUCTION

Now-a-days there is loss of life due to the delay in the arrival of ambulance to the hospital in the golden hour. This delay is mainly caused by the waiting of the ambulance in the traffic signals. if the ambulance enter in the traffic signals the path of the hospital are ON condition then we can avoid the delay. Thus we propose a new fully automatic traffic signal controlling system, that the ambulance would be able to cross all the traffic junctions without any delay. Every traffic junctions are fully automated to controlling the traffic flow.

Each traffic junction are identified as node of the path, and each junction equipped with GSM modem, this modem are controlled by central control unit.

II. EXISTING WORK

In existing method the accident vehicle can be identified by vibration sensor and GPS based vehicle tracking speed based.   Accident occurrence signal is sent to the microcontroller, which converts the analog signal to digital signal. Converted digital signal is stored and also the SMS is send to the base stations through the GSM modem. This   is connected to the serial port of the microcontroller. But the location of the accident is difficult to find and there is no intimation to the vehicles which are around that area. Due to that many accident occurs unknowingly. If when the vehicle is identified in the correct location but it takes much more time for the ambulance to reach the hospital. Because there is no proper traffic signal controlling in that time of ambulance entry. So there is a many loss of life during the blockage in the traffic signal.

III. PROPOSED WORK

The main objective of the project is if a vehicle has meet accidents, immediately an alert message with the location coordinates is sent to the Control center. From the control center, a message is sent to the nearby ambulance. Also a signal from control center is transmitted to all the traffic junctions in between the ambulance and vehicle location. Also an alert message intimation is given to the surrounding vehicles which are near to the accident vehicle, to the police control room and also to their relatives. The vehicle accident was sensed by the microcontroller in the vehicle unit using vibration sensor and message is passed to the control unit. After the control unit send the message to the accident location near ambulance. The ambulance unit acknowledge the signal only if it is free.
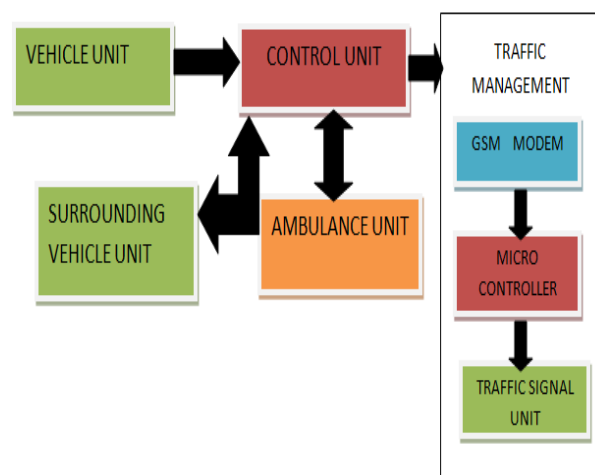

Fig. 1 functional block diagram

After the acknowledge signal control unit control the Traffic signal section through RF communication of ambulance unit. Then the ambulance will automatically control the traffic signals which are in the path to the hospital. Thus the ambulance reaching the hospital in a faster manner.

This system consists of four main units, which coordinates with each other and makes sure that ambulance reaches the hospital without any time lag. Thus our system is divided into following four units,

➢ The Vehicle Unit
➢ Control Unit.
➢ The Ambulance Unit.
➢ Traffic Junction Unit.

The vehicle unit installed in the vehicle, it senses the accident and sends the location of the accident to the control unit. The control unit finds the nearest ambulance to the accident spot and the shortest path between accident spot and the nearest hospital. The control unit sends nearest path to the acknowledged ambulance. Also this information is transferred to the all traffic controls unit nodes in the path of ambulance and makes it ON, which ensures that the ambulance reaches the hospital without delay. Same time the accident happened vehicle unit also sends the accident information spot to the nearby vehicles.
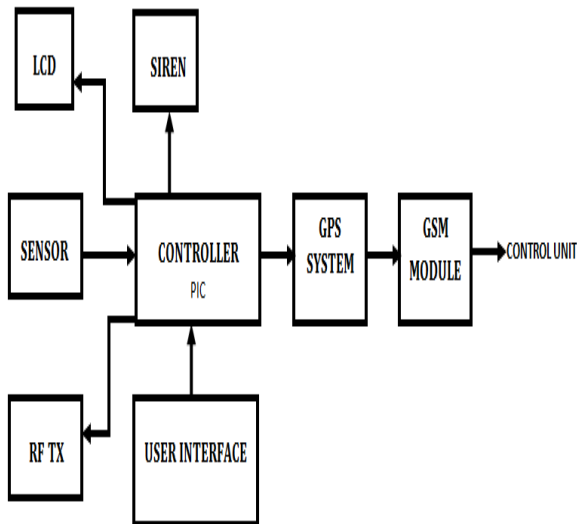
IV. VEHICLE UNIT

(A)ACCIDENT VEHICLE

Fig. 2 vehicle unit accident diction block diagram

Every vehicle should have a vehicle unit. The unit consists of a vibration sensor, controller, siren, a user interface, GPS system and a GSM module. The vibration sensor used in the vehicle will continuously sense for any large scale vibration in the vehicle. The internal controller compares sensor values with a threshold value (for an accident). If the observed value equals or exceeds that, then the controller automatically switch ON the siren and also trigger the timer unit in the vehicle. In case a minor accident, then the passenger would not need the service of the ambulance, then user switch off the siren before the timer counts reach to zero and reset the vehicle unit process. Else if the user is unconscious or fatally wounded mean needs an ambulance service, then the siren is left ON until the timer counts to zero. The system controller triggers communication modules (GSM MODULE and the GPS SYSTEM) inside the vehicle.

The GPS SYSTEM used for finds out the current location of the vehicle (latitude and the longitude) which is the location of the accident spot and intimate location data to the GSM MODULE. CONTROL UNIT receives accident spot and vehicle data through GSM MODULE, whose GSM number is already in the module as an emergency number. And also there will be an intimation message to the surrounding vehicles about the accident by RF Transmitter for safe going or to give any first aid to the member who in accident.

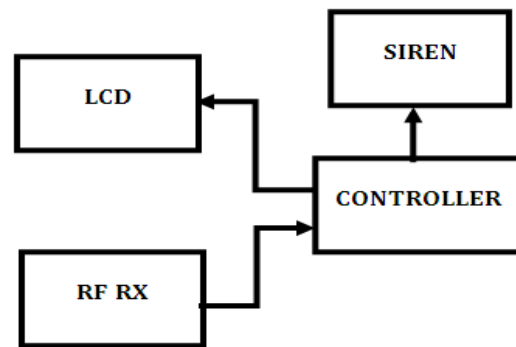### (B) RECEIVER VEHICLE (intimation vehicle)

Fig. 3 nearby vehicle accident identification block diagram

This is an part of the another vehicle which receives RF signal by the RF receiver about an accident as an intimation message to that vehicle. Thus it would help the accident vehicle. And also there will be an buzzer for the confirmed intimation about the accident.

V. ALOGRITHM

STEP 1: System is get initialized.

STEP 2: It checks for the normal system,if yes the system is re- intialized else it checks for the vibration sensor output.

STEP 3: If vibration sensor value exceeds the given threshold value, it is confirmed that an accident is occurred,else the system is re-initialised again.

STEP 4: An user switch is given,if that switch is pressed with an time given the accident alert message is terminated, else the alert message is send.

STEP 5: The alert message is send with the co-ordinates of the accident spot to the number given or to the control unit.
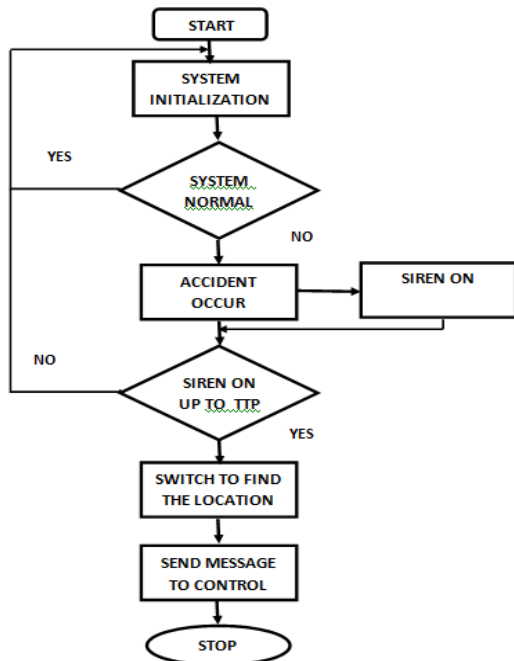
(A) FLOW CHART FOR VEHICLE UNIT

Fig. 4 functional flow diagram

VI. AMBULANCE AND TRAFFIC UNIT
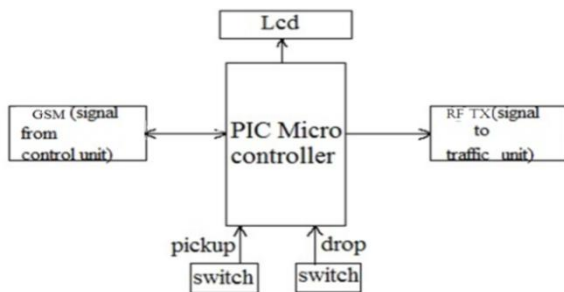
(A) AMBULANCE UNIT

Fig. 5 ambulance unit functional diagram

The controller receives accident information from vehicle unit and also accident spot. Then it start search the nearest ambulance to the accident spot and also find the shortest path between source and destination location send the path information to available ambulance unit . source point is ambulance unit and destination vehicle unit location. It also sends shortest path information to the ambulance unit, which ensures that the ambulance reaches the hospital without delay. At the same time, the ambulance unit turns ON the RF transmitter. This will lead to communicate with the traffic section

(B)TRAFFIC UNIT
The RF receiver is turned ON whenever traffic signal controller receives the accident data information and the RF receiver searching the ambulance. Whenever the ambulance reach   approximately 100m distance from the signal unit then the controller switch the green signal for ambulance arriving path only.
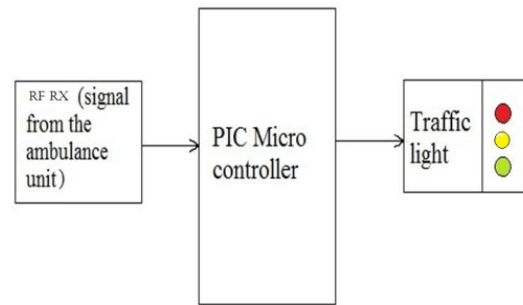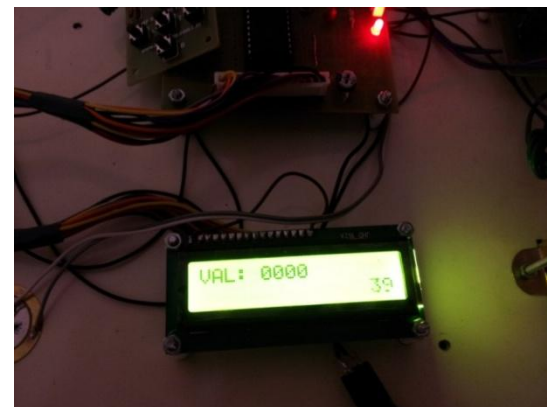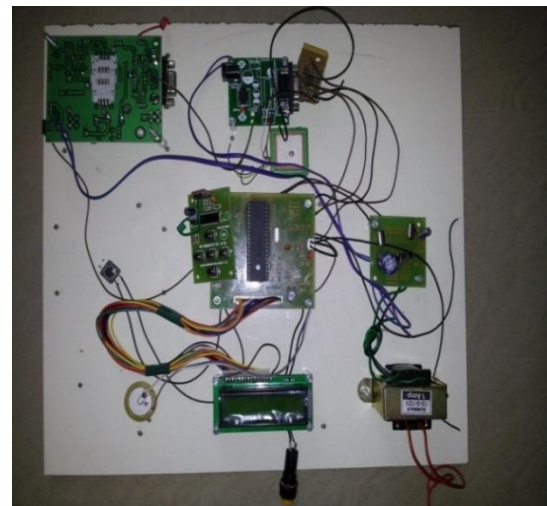

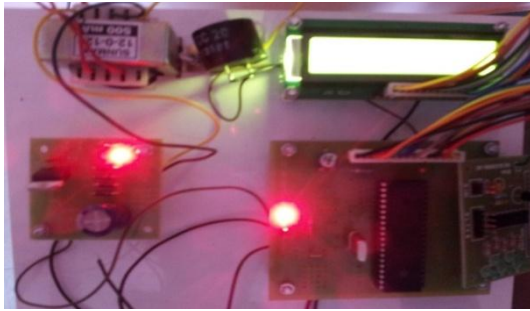Fig. 6 Traffic unit functional diagram

VII. IMPLEMENTED HARDWARE MODELS

(A) Accident unit
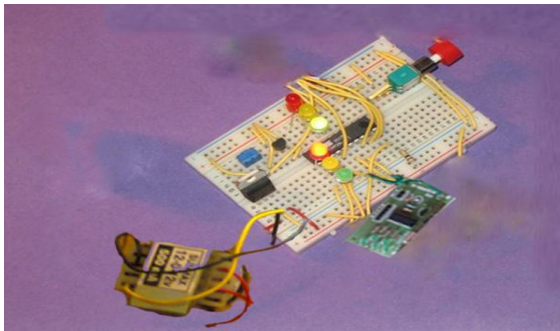

(B) Intimation unit

(C)Ambulance unit

(D)Traffic unit

VIII. CONCLUSION

Thus the vehicle which meets with an accident is detected by the vibration sensor. And the intimation is given to the vehicles which are around the accident spot and to the police control room and to their relatives. Also the location of the vehicle is found out by GPS and the coordinates are sending through the GSM to the control unit. And the control unit sends the information to the ambulance for the rescue process. After the reception of the accident information the ambulance reaches the accident spot to rescue the patient and goes to the hospital by automatically controlling the traffic signals by RF signal communication. Thus there will be free flow movement for the ambulance in the traffic jam. And thus the hardware implementation was done successfully.

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BIOGRAPHIES

Mr. S. Munaf completed M.E in VLSI DESIGN from Anna University of Technology and he completed B.E in Electronics and Communication Engineering from Government College of Technology. Diploma in Electronics and Communication Engineering from Nanjiah Lingammal Polytechnic, Mettupalayam. Pursuing Ph.D under Anna University in the area of VLSI. She is having 7 years of teaching experience.

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