Retrieve system of an intelligent ambulance using designate traffic shifting

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ABSTRACT: Traffic congestion and tidal flow management are two major problems in modern urban areas which leads to road accident and loss of life. Automatic Ambulance Rescue System (AARS) is introduced to avoid the loss of life. The main idea behind this scheme is ambulance can reach smoothly to hospital in time, by mechanically controlling traffic lights in path. The sensor senses the spot and the nearest ambulance reaches the accident spot. The traffic lights in the path of the ambulance are controlled. The ambulance is guided to hospital by server through shortest route. The vehicle unit installed in vehicle senses the accident and sends the location of the accident to the main server in the ambulance section. The main server finds the ambulance, nearest to the accident spot and also shortest path between ambulance, accident spot and nearest hospital.

KEYWORDS: MicroElectroMechanical Systems (MEMS), Automatic Ambulance Rescue System (AARS), Vehicle Section, Ambulance Section, Signal Section, Global System for Mobile Communications (GSM), Global Positioning System (GPS), Microcontroller.

INTRODUCTION

India is the second most populous Country in the World and is a fast growing economy. It is seeing terrible road congestion problems in its cities. Infrastructure growth is slow as compared to the growth in number of vehicles, due to space and cost constraints. Also, Indian traffic is nonlane based and chaotic. It needs a traffic control solutions, which are different from the developed Countries. Intelligent management of traffic flows can reduce the negative impact of congestion. In recent years, wireless networks are widely used in the road transport as they provide more cost effective options. Technologies like ZigBee, RFID and GSM can be used in traffic control to provide cost effective solutions. RFID is a wireless technology that uses radio frequency electromagnetic energy to carry information between the RFID tag and RFID reader.

TRAFFIC CONGESTION

Traffic congestion is a condition on transport networks that occurs as use increases, and is characterized by slower speeds, longer trip times, and increased vehicular queueing. The most common example is the physical use of roads by vehicles. When traffic demand is great enough that the interaction between vehicles slows the speed of the traffic stream, this results in some congestion.

As demand approaches the capacity of a road (or of the intersections along the road), extreme traffic congestion sets in. When vehicles are fully stopped for periods of time, this is colloquially known as a traffic jam or traffic snarl-up. Traffic congestion can lead to drivers becoming frustrated and engaging in road rage. ZigBee technology is a wireless standard designed to operate low-power wireless sensor networks, and it can aid emergency vehicles in dealing with traffic congestion.
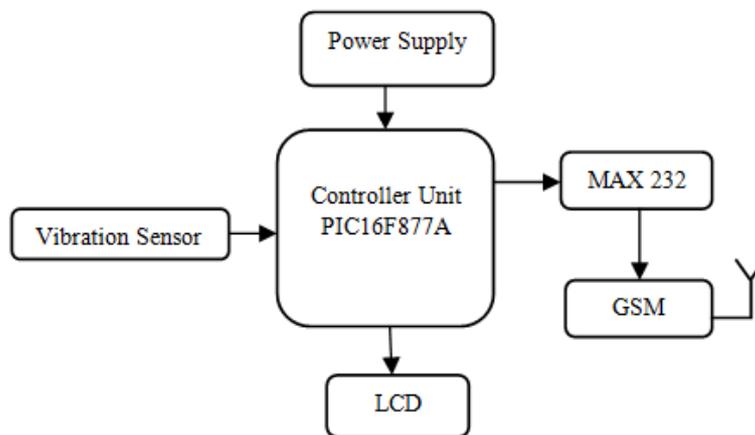
THE PROLIFERATION OF VEHICLES

Urbanization is a global phenomenon, and its effect is more pronounced in developing countries like India. In these countries, there is a drastic improvement in industrialization. Due to an increase in industrialization, the usage of vehicles has developed countries but with the number of fatalities somewhat less due to modern infrastructure. In developing nations, due to a lack of infrastructure, motor vehicle fatalities are comparatively higher. Globally, road accidents claim lives of 1.24 million people per year with as high as 50 million people injured. The statistics show that countries have various numbers of fatalities and accidents. In India, statistics show that fatalities and accidents have been increasing. "Bus priority control system based on wireless sensor network (WSN) and Zigbee" (Wu et al., 2006) provides an overview of how buses are routed along roadways with all of the necessary information to control traffic congestion.

VEHICLE SECTION

In Vehicle Section, all the equipments are connected to microcontroller. The Piezoelectric sensor is used as vibration sensor to measure flex, touch, vibration and shock. Piezoelectric sensor is a device that uses piezoelectric effect to measure changes in acceleration, pressure, temperature, strain or force by converting them to an electric charge. Sensor based on piezoelectric effect can operate from transverse, longitudinal, shear forces and are insensitive to electric field and electromagnetic radiation. This piezoelectric sensor measures dynamic pressure which includes blast, ballistics and engine combustion under varying condition. An electronic amplifier is an electronic device that increases power of a signal and converts alternating current into direct current.

Here, we have used Microcontroller ARM7 for this vehicle section. ARM7 is a group of older 32-bit ARM processor. ARM is a family of instruction set architecture for computer processor based on a reduced instruction set computing. The sensor installed in the vehicle unit senses the accident and GPS tracks the location of the accident. Through GSM, it sends the location of the accident to the ambulance section [13]. The buzzer produces sound when accident occurs. The central unit finds the ambulance, nearest to the accident spot and also the shortest path between the location of the accident, ambulance and the nearest hospital. The ambulance crosses all the traffic junctions by automatically controlling the traffic Signals and Reaches The Nearest Hospital. Here, Wireless Technologies Are Used To Transfer Information.
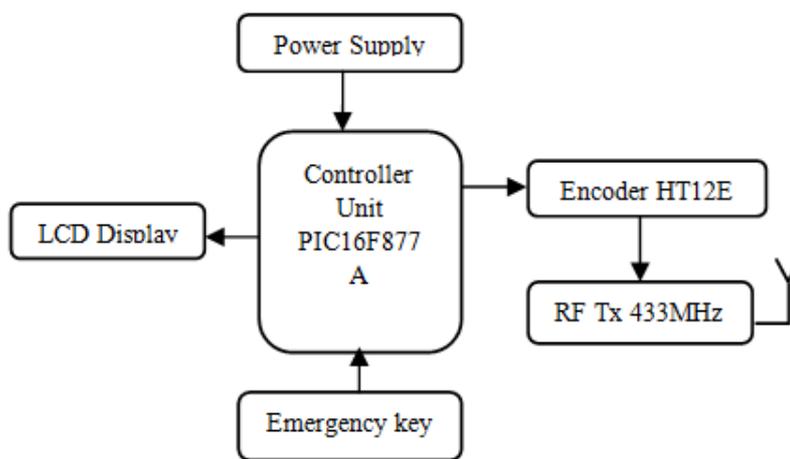
AMBULANCE SECTION

In ambulance section we used PIC microcontroller. The serial number of the IC is 16F877A.This section consists of crystal oscillator, power circuit and serial communication.9v input supply is given and the operating voltage is 5v.the crystal oscillator is used to work according to the frequency change. In a PIC microcontroller, there are 40 pins and 5 ports; port a to port e.pic is a family of modified architecture microcontrollers. An encoder is a device, transducer circuit, algorithm, Software program, or person, which converts data from one format or code to another, for the purpose of speed, standardization, security and compression. RF communication uses the transmitter or receiver.
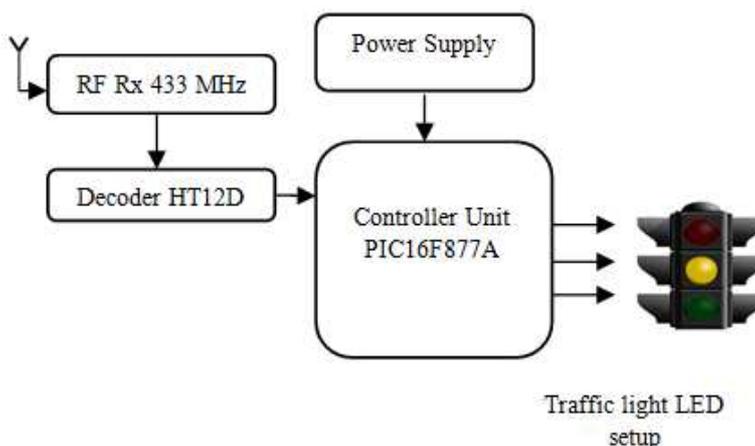
TRANSMITTER NODE

SIGNAL NODE

In Signal Section, the functions of the microcontroller section are same as in the ambulance section. Here, we used reader device, decoder unit and signal indicator. The reader device receives the data which the RF transmitter sends from the ambulance section. Any device may act as a reader that can display text on a screen. A decoder is a device that performs the reverse operation of an encoder. To recover the original information, it undoes the encoding. The received signal strength indicator (RSSI) measures the power present in a radio signal which is received. RSSI is a radio receiver technology metric, which is normally invisible to the user of the device which consists of receiver, but is directly known to users of wireless networking. The output of RSSI is a DC analog level. The ambulance unit is the transmitter and each signal is the receiver.

In this way, this system helps the ambulance to reach the emergency site and then to hospital without time delay so that intensive care can be given to the patient in the golden hour and many lives can be saved.

CONCLUSION

In this paper, we have described a design for automatically controlling the traffic signals so that location of the accident. Through GSM (Global System for Mobile Communications), it sends the location of the accident to the ambulance section. The central unit finds the ambulance, nearest to the accident spot and also the shortest path between the location of the accident, ambulance and the neares the ambulance would be able to cross all the traffic junctions and reach hospital without time delay.

The sensor installed in the vehicle senses the accident and global positioning system (GPS) tracks the hospital. Here, wireless technologies are used to transfer information.

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