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Research paper

Intelligent Vehicular System with Speed Limit

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Abstract

In the scholarly world and the car business vehicular communication is one of the important point. The point of this developing interest is to build up a compelling communication network to the Intelligent Transportation System. Here in the proposed paper we exhibited remote base station model with a great put assessment. The auto movement demonstrate and lining framework with variable solicitations are used remote to get point display. The wireless networks performance may be compact from a spread of parameters, equivalent to radio communication vary, the quantity of shoppers may vary and speed of the vehicle. Some of the parameters are analyzed and displayed.

Keywords: *Arm LPC 2148 microcontroller, zigbee Module, IR Sensors, gas sensor, temperature sensor, vehicle unit, Sim900 GSM/GPRS modem.*

1. Introduction

It is necessary to enhance safety on roads, efficiency in traffic and also to minimize impact of environment of road safety which are very serious for a change in both academics and in industry. Vehicle to vehicle in ad-hoc mode and vehicle to infra structure are the two realistic ways were researchers show much intrest to develop networking technology and vehicular communication with fixed nodes throughout the road. For building powerful Intelligent Transport Systems[1] (ITS) V2X is the foundation stone to exchange wireless information potentially Automakers and governments in some developed countries like USA, Japan, Europe are making great efforts to have a single through by respective and one common proposal such as CAR 2 CAR data communication, communication for vehicle security etc. The foundation for DSRC (Dedicated Short Range Communications) will be used as this standard. By using such type of technology there is potential to raise safety, reduce traffic moment and provide safe journey for patrons and drivers on the road with accelerate operations like INTERNET[4], games by using internet, toll collection[9], payments drive-through [5], etc. DSRC is one of the important step in the future, as it allow inter-vehicle and vehicle[8] for framing wireless communication. In recent trends cellular networking has become a very leading and also available widely at a low cost broadly for all applications like public wifi, commercial hot spots and in some home applications based on IEEE802.11 technology. The DSRC beginning thought is to outfit vehicular system hubs with off-the-rack remote innovation, for example, IEEE802.11a. This innovation is practical and can possibly develop and new forms have been as of late created. The most recent trendz of wireless local area network (WLAN) is by using IEEE802.117 technology. The IEEE 802.11n benchmark guarantees to enhance and expand most well known WLAN guidelines by essentially expanding throughput, unwavering quality and reach. These days attitudes of WLAN-based get to innovation are transcendently to stationer indoor and open air clients who are most gradually moving and in go restricted. In spite of the way that the benchmark is not produced for quick unique use, no limits are to be assessed for vehicular correspondence frameworks". The inspiration is to comprehend the communication in between the speed of vehicle and great put of WLAN type system.

2. Design of Proposed Hardware System

The main goal of the proposal is to introduce a theoretical model of a microcontroller which is based on variable electronic speed representative which can be executed to monitor the speed of any vehicle relying upon the neighborhood speed constrain. Every place, can be marked and divided into definite zones.

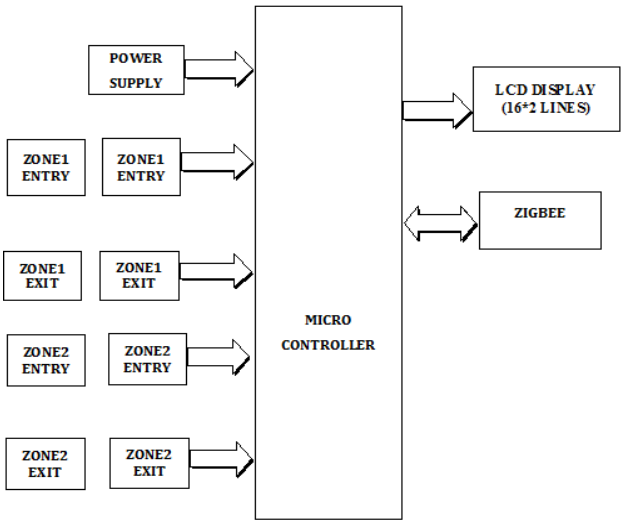

Fig. 1: Block diagram

Depending upon the area of the business, residential, and industrial regions the divisions will divides in which they come under. The central business is a very busy traffic zone[11] demands the least speed limit[10], with the residential and industrial zones having lesser traffic frequency, the speed limits will vary accordingly. Also when a vehicle in a zone nearby area, it will get the information about the traffic (number of vehicles) in respective zone[12]. So driver can select suitable path for driving.

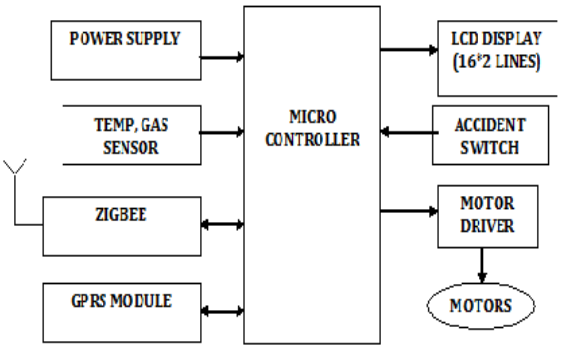

Fig. 2: Block diagram

3. Board Hardware Resources Features

Zigbee

Zigbee modules include a UART interface, which permits microchip or any microcontroller to quickly utilize the Zigbee administrations convention. The host serial level port logic should be compatible with the XBee's logic levels of range 2.8v–3.4v.These care should be taken by hardware designer of Zigbee. When the host is directly connected to the XBee UART logic level translators like 74LVTH125 or the logic level standard RS-232 IC are used. DIN pin is used to transfer data to the X-Bee module, and it should be in the asynchronous serial format, which consists of a stop bit, a start bit and 8 data bits., no bit inversions are necessary within the asynchronous serial data stream Because of the input data goes directly into the input of a UART within the X-Bee module. The X-Bee's UART take care of all of the required timing and parity checking automatically.

IR Sensor

The TSOP21-arrangement are scaled down collectors for infrared remote control frameworks. On lead outline preamplifier and Stick diode are gathered, IR channel is composed of epoxy bundle. A microchip is to decode a demodulated flag straightforwardly. short burst transmission codes and high information rates are the main advantages with this operation. preamplifier and Photograph indicator in one bundle

- PCM recurrence by Internal channel.
- Electrical field unsettling influence is an improved protection
- Similarity of TTL and CMOS
- Output dynamic is very low
- Power utilization is low
- Against surrounding light high insusceptibility

Unforeseen yield beats because of clamor or unsettling influence signals are stayed away in TSOP21 circuit. An automatic gain control, an integrator stage and a band pass filter, which are used to minimize such disturbances. Carrier frequency, burst length and duty cycle are the distinguishing mark between data signal and disturbance signal.

Gas Sensor

Smoke sensors are used to sense any splatter of smoke and any hazardous gases, in addition to this the final aim is to have a caution to that, so a strategic distance can be maintained from this type of harms in the ventures. There are numerous of applications with this type of sensors like office zones and in any corporate as these are combined to signal with miniaturized controller scale. Ionization finders are divided into two parts a wellspring of ionizing radiation and an ionization chamber. The first part is a well spring of ionizing which contains a moment with an amount of americium-241, which is nothing but an alpha particles. The second one consists of a chamber again divided into 2 plates with an separation distance of a centimeter. Initially a voltage is applied to one of the plates with positive and other plate with negative with the help of a battery. The iotas noticeable amount of alpha particles are always discharged by americium thump electrons all round. Oxygen and nitrogen ionizing will take place in the load. At negative plate emphatically charged nitrogen and oxygen iotas are attracted and to the positive side of the plate electrons are pulled away by producing a consistent little electric currnt.at this point of time when any dangerous smoke or gas enters into the ionization chamber, this smoke particle will join with the particles and kill them. Therefore these shouldn't achieve to that plate. As a result a drop in the level of current will take place in between the two plates by triggering an alert.

GPRS Technology

General parcel radio administration (GPRS) is a system overlay for TDMA, GSM and CDMA consists of a bundle based information carrier benefit for a benefits of remote correspondence. This applies a rule i.e a bundle ratio to transfer client data in a proficient route between outer bundle info and GSM portable stations. Bundle exchanging is that the place info is an element into parcels that square measure transmitted severally and subsequently reassembled at the lower than fascinating finish. The world's driving parcel based Internet correspondence conventions is unpins by GPRS, X.25 and Internet convention, a convention that is utilized primarily in Europe. GPRS empowers any current IP or X.25 application to work over a GSM cell association. Cell systems with GPRS capacities are remote expansions of the Internet and X.25 systems.

Fig. 4: GPRS module

4. Performance Analysis

Zone Section

In this we have microcontroller, four sets of IR sensors, power supply, LCD and a ZIGBEE module to transfer the information to vehicles about the zones.

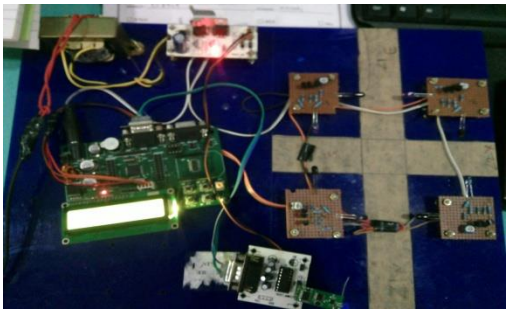

Fig. 5: Zone section

Vehicle Section

In this we have microcontroller, temperature senor, smoke sensor, LCD, Zigbee module to receive the information from zone section about the zones and a GPRS module to send data to server and power supply.

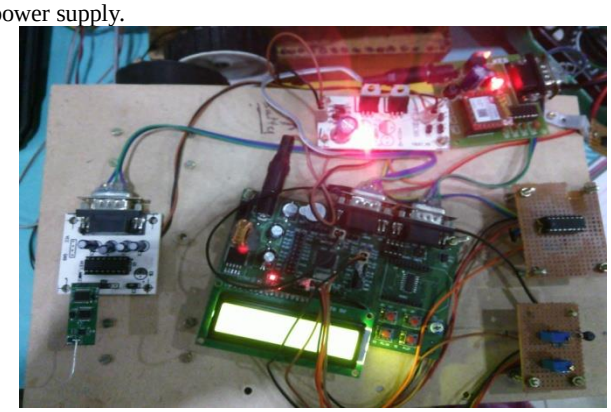

Fig. 6: Vehicle section

Here we are using IR sensor technology to entry and exit the zones .these IR sensors are connected to the microcontroller. When a vehicle entered into zone1 it will be displayed on LCD and information passes to a vehicle through Zigbee communication. Similarly a vehicle exited from the zone1 it displayed on LCD and information passes through Zigbee communication.

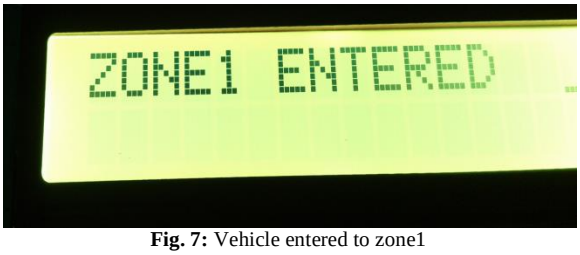

Fig. 7: Vehicle entered to zone1

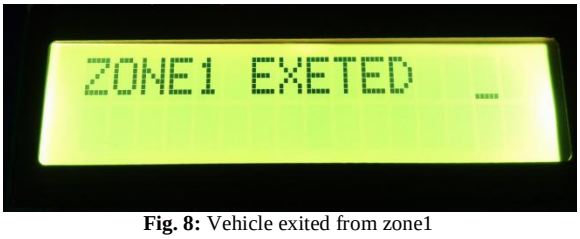

Fig. 8: Vehicle exited from zone1

IR sensors are connected to the microcontroller. When a vehicle entered into zone2 it will be displayed on LCD and information passes to a vehicle through Zigbee communication. Similarly a vehicle exited from the zone2 it displayed on LCD and information passes through Zigbee communication.

Fig. 9: Vehicle entered to zone2

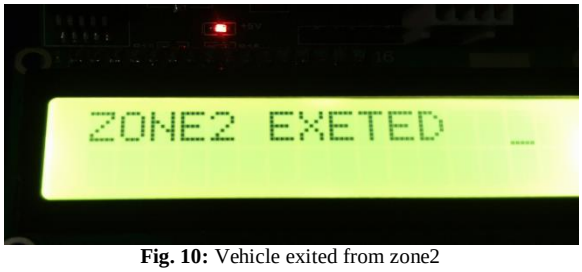

Fig. 10: Vehicle exited from zone2

Temperature and Smoke sensors are connected in a vehicle section microcontroller to know the parameters of vehicle and the values are displaying on the LCD.

Fig. 11: Vehicle parameter values (temp, smoke)

Fig. 12: Data sending to IP webpage

Fig. 13: Data sent to IP webpage

By using GPRS technology we are transferring the vehicle information like vehicle number, speed of a vehicle and parameters of a vehicle to the server [9-12].

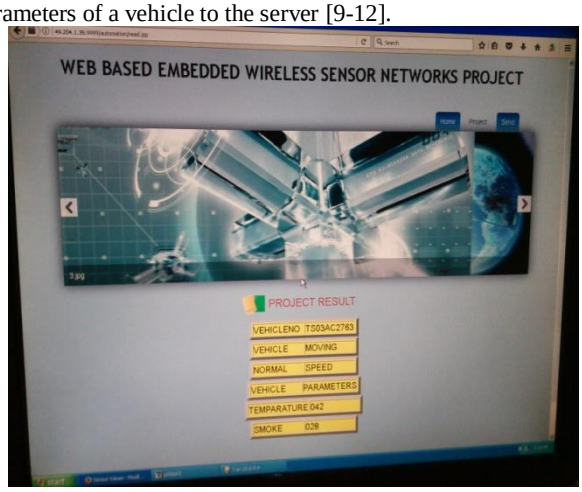

Fig. 14: Monitoring data on web page

5. Conclusion

In this a field trials assessment combined with hypothetic examinations which are of standards of IEEE802.1ln contrasting and condition of the heritage of the vehicle standard. This trial test has done with regards to basic situation of any of the vehicle to reach to a point. A different speeds are been trying for execution of the WLAN.[13] and 14] Remote system connect under familiar number of vehicles individually dynamic clients at the same time acknowledging such field trials for good put assessment is exceptionally troublesome and expensive. In this manner a basic numerical model for good put assessment of vehicular correspondence frameworks in V2I situation was exhibited and investigated for understanding the essential procedures in remote information systems preceding leading bigger field trials.

6. Future Scope

In the above project we can add GPS technology to know the position of a vehicle. By using GPS technology we get exact position of the vehicle in form of latitude and longitude values. When a vehicle met to an accident at any place it is easy to know the position of vehicle by using GPS.

Another technology we can use in this project is alcohol detection. By using this technology we can detect alcohol percentage of driver and when he crosses his limit then vehicle should automatically off.

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