

Acceleration Control with Latitude and Longitude & Toll pay Transactions on Mass and RFID Method

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Abstract: -- Now- a- days the usage of vehicles are increasing day by day in human life. Every home is having at least one or two vehicles, as the traffic has been increasing in the present world, due to increase in number of vehicles there is a probability of more number of accidents. We are having a more number of technologies to reduce the number of accidents. The method involves in this paper have more intelligent and interactive methods for avoiding the accidents. The proposed system is not involved in framing the protocol to avoid accidents, but, involved to implement a system to control the speed of the vehicles. This method provides an alternating system using a GPS technology (using latitude and longitude) that controls vehicle speed. Most of the tolls collect the pay using the type of vehicle, due to this an empty passenger vehicle has to pay the same amount as a full occupancy vehicle. To avoid this type of variation in payees a different method used, so as to get benefited by the owner of the vehicle, hence the proposed system deals with toll pay based on the mass using Load cell technology and RFID.

Key words:---Arduino, GSM/GPRS, GPS, RFID, IR SENSOR

I. INTRODUCTION

In the present growing economy, the country also faces the uprising of accidents due to high speed. The development of satellite communication technology is easy to identify the vehicle locations i.e. latitude and longitude. Vehicle tracking systems have come up with this technology to the day-to-day life of the common person. Today GPS used in cars, and ambulances, vehicles are common sights on the roads of developed countries. All the existing technology support tracking the vehicle place and status. The tracking system includes GPS and GSM Based operations . This system is necessary for the many of applications of both GSM and GPS systems and the wide usage of them by millions of people throughout the world [1]. Among all the advanced communication technologies GPS is the utmost technology and which provides very robust information of location and time in all Weather conditions and at all times. GPS is often used by civilians as a navigation system. On the ground, any GPS receiver contains a computer that "triangulates" its own position by getting bearings from at least three satellites.

Year	Number of accidents		Number of persons		Accident severity
	Total	Fatal	killed	Injured	
2007	4,07,497	73,630 (18.1)	84,674	4,08,711	20.8
2008	4,06,726	73,589 (18.1)	85,998	4,35,122	21.1
2009	4,29,910	79,357 (18.5)	92,618	4,64,521	21.5
2010	4,39,255	83,491 (19.0)	94,968	4,65,282	21.6
2011	4,60,920	93,917 (20.4)	1,05,749	4,96,481	22.9
2012	4,79,216	1,01,161 (21.1)	1,14,444	5,13,340	23.9
2013	4,84,704	1,06,591 (22.0)	1,19,860	5,23,193	24.7
2014	4,86,884	1,10,993 (22.8)	1,25,660	5,15,458	25.8
2015	4,99,628	1,19,538(23.9)	1,34,513	5,27,512	26.9
2016	4,97,686	1,21,618(24.4)	1,42,485	5,11,394	28.6

FIG 1 : Previous Years Statistics of road accidents

II. ARDUINO SYSTEM

Arduino is a prototype platform (open-source) it simplifies the amount of hardware and software development you need to do in order to get a system running. The hardware platform already has the power and reset circuitry setup as well as circuitry to program and communicate with the microcontroller over USB.. It consists of a circuit board, which can be programed (referred to as a microcontroller) and a ready-made software called Arduino IDE (Integrated Development Environment),
Features are:

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- ◆ Arduino boards are able to read analog or digital input signals from different sensors and turn it into an output such as activating a motor.
- ◆ You can monitor the board functions by sending a set of commands to the microcontroller on the board via Arduino IDE (referred to as uploading software).
- ◆ Unlike most previous programmable circuit boards, Arduino doesn't have an extra piece of hardware (called a programmer) in order to load a new code onto the board. You can simply use a USB cable.
- ◆ Finally, The Arduino Uno can be powerd via the USB connection or with an external power supply. If we are using external power then we can supply 6 to 20 volts.

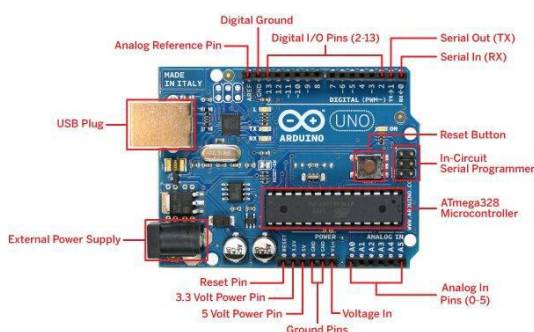


FIG 2 : Arduino

In our proposed design arduino is interfaced with modules GSM/GPRS,GPS,RFID and Weighing equipment.

III . SURVEY OF THE RELATED WORK

In [2], the hardware and software of the GPS and GSM network were developed. The System has GPS and GSM first is a mobile unit and another is controlling station. The system processes, interfaces, connections, data transmission and reception of data from controlling system . These results are compatible with GPS technologies. In [3], a vehicle tracking system is installed in a vehicle to track the vehicle's place. The proposed system is dealt to track the vehicle speed that works using GPS and GSM technology. This system is built based on arduino, for tracking and positioning of any vehicle by using Global Positioning System (GPS) and Global system for mobile communication (GSM). This design will continuously monitor a moving Vehicle and send the status of the Vehicle. In [4], Kai-Tai Song and Chih-Chieh Yang have a designed and built on a real-time visual tracking system for vehicle safety applications. In this paper built a vehicle tracking algorithm,

automatically detect and track the moving objects, like cars and motorcycles, ahead of the tracking vehicle. The proposed system using a CMOS and NMOS embedded processor architecture. The constructed stand-alone visual tracking system validated in real road tests. In [5], the automatic monitoring system based on SMS and GSM was implemented. Based on the total design of the system, the hardware and software designed. The GSM network is a medium for sending the information. It has two parts that are the monitoring center and the remote monitoring station. The monitoring stations have a communication module of GSM with computer .The software-monitoring center and the remote monitoring station implemented by using VB.

In [6] this paper, the proposed tracking system based on cloud computing infrastructure. The data is sent to the web server using GSM. All the vehicles equipped with GPS antenna to locate the place and to monitor the speed of the vehicles. The proposed technology significantly avoids the accident in highways.

IV . SPEED CONTROLLING SYSTEM

In this proposed work, a novel method of vehicle tracking and alerting system used to track the vehicle speed by using GPS and GSM technology. The controller sends the message about the place of the vehicle to the owner or authorized person When send SMS to the controller. **“To avoid the road accidents, at accident prone zones and city's by using GPS and GSM technology to track and alert the vehicles speed”** Generally vehicles are moving with high speed this will leads to many accidents Here in this method the vehicle before reaching to the accident prone areas i.e

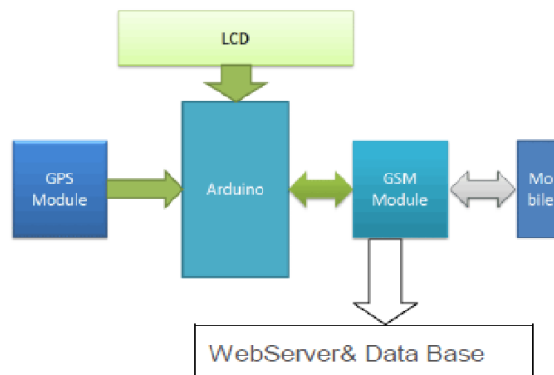


FIG 3 : Block Diagram

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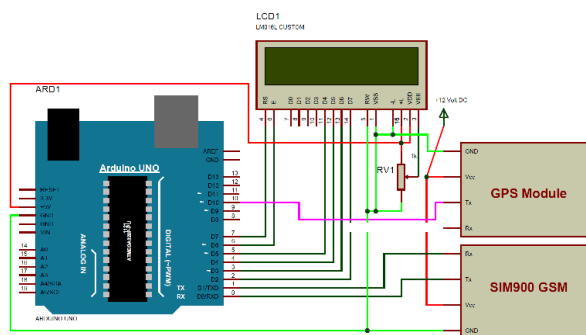


FIG 4: Physical view of Acceleration system

4.1 Operations of proposed System:

highways, cities (before 100mts or 50mts) the GPS track's the vehicle and identify the vehicle speed. If the speed of the vehicle is more compared to the pre programmed minimum speed at particular area. A message will send from GSM to the driver and owner of the vehicle (i.e., you're entering into accident prone area please maintain 30kmph up to 100mts). If the driver didn't care about that message and maintained high speed again a message will send (you're exceeded the limited speed Rs/-100 penalty is assigned). This penalty successively increases as speed increases. The penalty money is directly transferred to the government account i.e. the vehicles numbers and data will be stored at data base along with bank account numbers at the end of the month the entire data will given to the owner.

"To assign toll rates based on Vehicle Loads"

In present toll plazas, toll rates are fixed based upon the type of vehicles, but our proposed system suggests the payments of toll based on the loads. This system benefits so many users while carrying empty loads and vehicles with less loads.

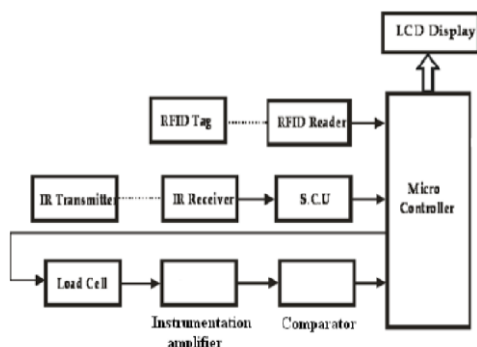


FIG 5: block diagram of toll gate system

The flow starts from the RFID tag which is detected by the RFID reader & sends the data i.e. The number and type of the vehicle sent to the controller. After the IR transmitter receiver will find the exact location of the vehicle on the weighing state to actuate the weighing operation. The load cell then weighs the vehicle accurately & sends the analog signal to comparator where it is compared with the stored data. The controller compares with the stored information value of respective toll & displays on LCD. The amount will be deducted from the Bank Based on the monthly Transactions.

4.2 GPS:

The first GPS (navigation system) was designed by Honda in 1983 [7]. Pioneer claims to be the first with aGPS-based auto navigation system, in 1990 [8]. Magellan claims to have created the first GPS-based vehicle navigation system in the U.S in 1995 [9]. Each GPS (satellite) transmits data that indicates the current time and its location. It transmits signals to a GPS receiver. This receiver requires an open area view of the sky, so they can only be used effectively outdoors. Generally GPS receivers use a mathematical process called trilateration. The outcome of a typical GPS survey includes geocentric position accurate to 10 m and relative positions between receiver locations to centimeter level or better.

4.3. GSM Modem

A GSM module is a digital mobile Cellular technology, This offers customized travel, financial, Reference and commercial information to the users [10]. It can operate in 400MHz, 900MHz and 1800MHz frequency bands. The GSM modem have a SIM through this we can connect to web server. The GSM Modem supports three types of services namely bearer or data services, supplementary services, and telecommunication services.

4.4: LCD

A 16x2 LCD is used for displaying the information it can capability to display 16 characters per line and there are 2 such lines. This LCD has the data and command registers. The command register have the command instructions given to the LCD.

4.5 : DATA BASE/WEB SERVER:

Here the data base is used to store the vehicular information. The data base give the monthly information like (speed of the vehicles, penalty and toll collection). The data base is working with the PHP and SQL programming. these programs are user friendly. We can also handle large amount of data on the web servers. The data base is equipped with the live monitoring system.

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Features:

- ◆ To create databases.
- ◆ To maintain databases.
- ◆ To analyze the data through SQL Server Analysis Services (SSAS).
- ◆ To generate reports through SQL Server Reporting Services (SSRS).
- ◆ To carry out ETL operations through SQL Server Integration Services (SSIS).
- ◆ To install different versions in one machine

FLOW CHART:

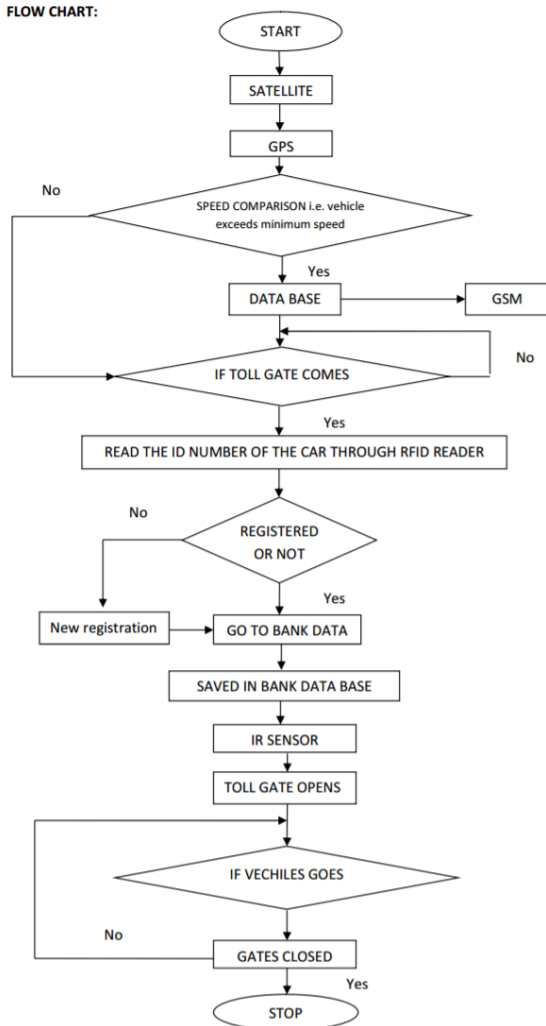


FIG 6: flow chart of proposed system

V:RESULTS

ID number	Vehicle Number	Latitude	Longitude	Time	Date
AS63451233	AP 02 6345	13 39.2954	079 28.0374	10:40	2/2/2017
AS63451233	AP 02 6345	13 39.2995	079 28.0560	10:45	2/2/2017
AS12467859	AP 04 7621	13 40.6548	079 30.4587	12:30	2/2/2017
AS12467859	AP 04 7621	13 40.2458	079 31.2478	12:40	2/2/2017
AS78922778	AP 07 3426	13 39.5487	079 30.3258	12:45	16/2/2017
AS78922778	AP 07 3426	13 34.1548	079 32.3569	13:05	16/2/2017
AS78922778	AP 07 3426	13 37.4598	079 33.5545	13:12	16/2/2017
AS09375850	AP 05 8721	13 42.4581	079 30.7849	11:25	16/2/2017
AS12678563	AP 09 5634	13 51.8547	079 27.5674	9:32	16/2/2017

Fig 7: results of acceleration system

S.NO	NAME	Vehicle Number	Amount	Status
TP12738746848	Vinod kumar	AP 26 1122	50	Pending
TP56487545345	Suresh yadav	AP 28 7654	100	Pending
TP46985634986	Ramesh	TN 01 4532	100	Success
TP64854557675	Lokesh	AP 03 8748	50	Success

Fig 8: results of toll plaza system

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