LOCATION BASED ACCELERATION CONTROL

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Abstract- The total number of accidents in Tamilnadu is 2, 16,978 in 2012 (ref. www.tn.gov.in) in which 74.74% (1, 62,280) happens in district roads. A survey says that the road safety diminishes because of reckless driving in the sensitive areas. Placing sign boards and laying speed bumps pleases the driver to reduce the speed, but most of the time this is not followed. Thus we are in need of an automatic way to arrest the reckless driving style. This paper aims in automatic control of reckless driving in sensitive areas.

Index terms: Global Positioning System, Androids,Electronic Throttle Control.

I. INTRODUCTION

The existing system with same motive of controlling reckless driving works in controlling the speed of the vehicle. Implementation of Speed control technique requires modification of Microprocessor Unit of the automobile. In addition, controlling the speed is complex and overrated. Our main objective is to install anAcceleration Control module in the automobile which has an electronic throttle control. Thereby controlling the acceleration in sensitive areas where the probability of accident occurrence is relatively high. Acceleration Control controls reckless driving in automobiles.

II. OVERALL FUNCTION OF THE SYSTEM

When the vehicles is in motion, the location of automobile identified and when the location is matched with the location of a sensitive area, then the message signal is given to the controller. The controller generates a control signal. This control signal switches the relay which makes the output from the accelerator pedal position sensor to flow through the clipper circuit. The clipper circuit clips the voltage that flows to the Microprocessor Unit of the automobile and there by controlling the acceleration.

The Fig.1 and Fig.2 explains about the overall process

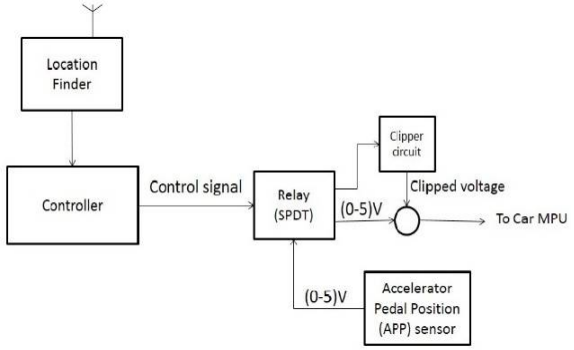


Fig.1 overall block diagram

III. LOCATION IDENTIFICATION

The Identification of Location is the primary step involved in the operation. This can achieved by several methodologies. Each of them are unique in their characteristics. The Navigation System and Map Data system uses sensors for detecting running distance, azimuth, etc., of a vehicle, and a memory for storing map data; computing data obtained, the location can be determined. This system has more complex.The next is RF signal method works byplacing RF transmitters of specific frequency in sensitive areas and having a receiver in the vehicle, presence of the vehicle in that specific area can be identified.On the other hand we have GPS modules that provide the co-ordinates of the current location, both the latitude and longitude. Because of the Constraints in the usage of, RF and Navigation system, we opted for Android phone GPS based Location tracking system.

A. Android Phone GPS based Location Tracking system:

As mentioned in the Navigation System for Vehicle, the location can be tracked using the GPS. Present day android phones have AGPS in them. Two different applicationsare developed in the java platformto achieve the overall function.

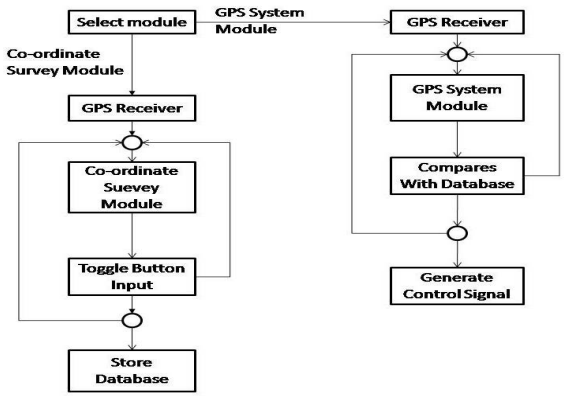


Fig2. Control flow diagram

1. Co-ordinate Survey Module:
The co-ordinate survey module created, displays the current co-ordinates and used to store locations. In order to store the current sensitive area location in a shared database, the toggle button is enabled. Once the toggle button is enabled both the latitude and the longitude values will be stored in the database until it is disabled. The co-ordinate survey module will be controlled by the database resource handler who will be the person to determine the sensitive areas.

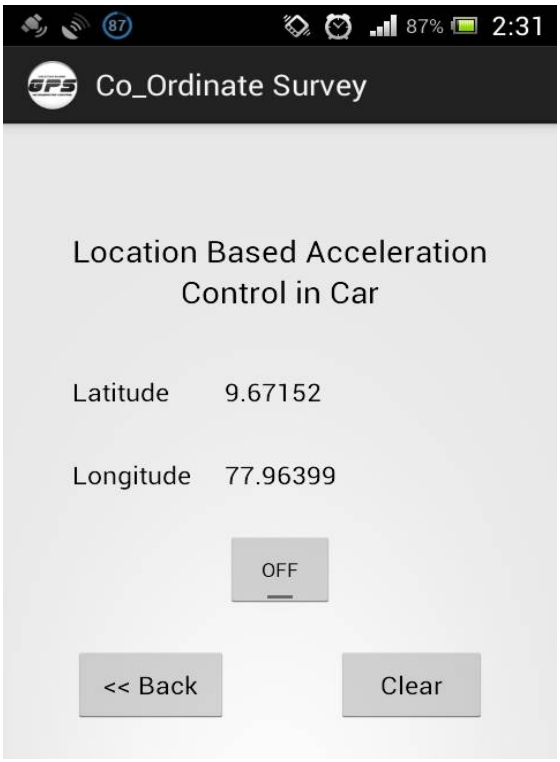


Fig.3 Co-ordinate survey Application (Android)

Fig.3 shows the screen shot of the application which is used to store the co-ordinates of the sensitive areas. In the sensitive areas, the switch is manually toggled and the respective co-ordinates are stored in a shared database.

2. GPS system module:
The GPS system module created, is the user end module. This module compares the current location with the shared database where the co-ordinates of the sensitive areas are stored. When the current location matches with the database values then a messagesignal is given to the controller and when the vehicle moves to the location whose co-ordinate is not stored in the database then the respective messagesignal is given to the controller in order alert that vehicle is out of the sensitive area.

Fig.4 shows the screen shot of the application which compares the current co-ordinates with the co-ordinates stored in the shared database. When the co-ordinate matches, a message signal is sent to the controller.

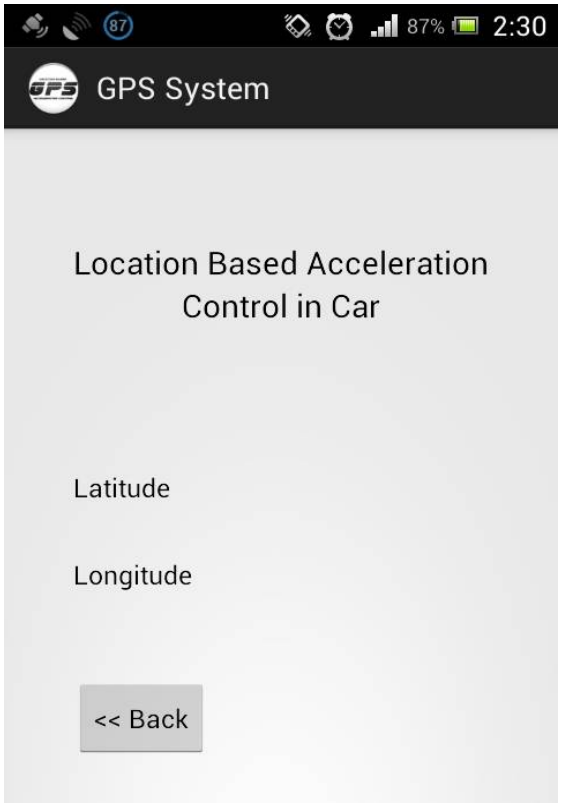


Fig.4 GPS System Module

IV. ANDROID AND CONTROLLER INTERFACE

Now we shall discuss about the interfacing of Android module and the controller.As we use android mobile phone, the message can be passed to the controller in two ways.

A. Using OTG cable:
This is the wired way of transferring message from mobile phone to the controller. This can be done only when the phone has the feature of USB access.

B Using Bluetooth:
This is the wireless way of transferring message from the mobile phone to the controller. This could be more suitable way to this module.

V. ACCELERATION CONTROL

To understand Acceleration Control we shall first know about Electronic Throttle Control.

A. Working of Electronic Throttle Control:
A regular Accelerator Pedal Position produces an output at the range of 0-5V. The position of the Accelerator pedal determines the output at the sensor. As the position of the Accelerator Pedal varies, the output of the sensor also varies as shown in Fig.5. This sensor output is given to the car Microprocessor Unit, in accordance to the output voltage the Micro Processor Unit decides the throttle. This is known as Electronic Throttle Control.

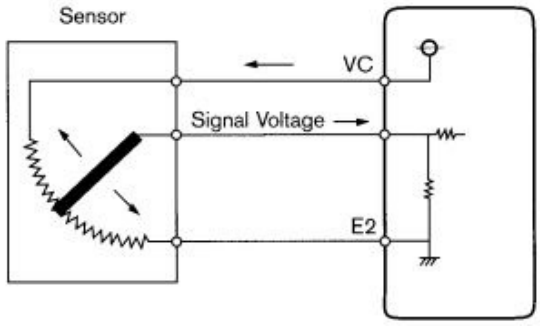


Fig.5 Accelerator Pedal Position Sensor

The electronic throttle generates an output of 0-5 V with respect to the force given on the accelerator. When the vehicle approachesthe sensitive area the acceleration has to be controlled.A clipper circuit is incorporated between the Pedal Position sensor and the Microprocessor Unit. Thus when the vehicle approaches a sensitive area the android module gives a message signal to the controller which switches the relay. The relay unit directs the output from the electronic throttle through the clipper and the clipped voltage is given to the automobile's Microprocessor Unit.

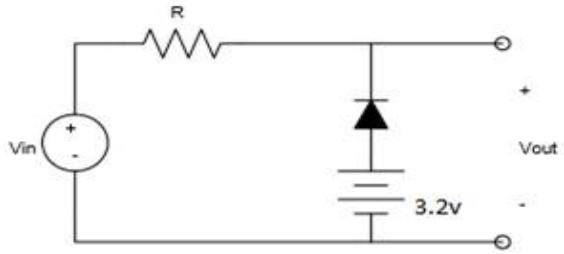


Fig.6 Clipper Circuit design

CONCLUSION

Implementation and working of this system is possible in a practical automobile, as we control the acceleration and not the speed. decreasing the acceleration even when the vehicle is running in its top speed is practically not a problem as it only makes the automobile controllable and will not lead to misery. Thus this system is a sufficient to reduce the accident rate.

FUTURE ENHANCEMENT

The android GPS module can be altered such that the system could use the GPS module without a mobile phone and hence it could be attached to the vehicles Electronic Throttle Control and thereby reducing the cost

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