A Novel Approach to Control Speed of an Automobile

[1] Dr.Manoj Priyatham M, [2] Aishwarya. B, [3] Aishwarya. K, [4] Lakshmi Mache, [5] Likitha. A

[1][2][3][4][5] Department of Electronics and Communication Engineering, R R Institute of Technology, Chikkabanavara, Bengaluru-560090

Abstract— Speed Control of automobiles is very much required in our daily life due to the increased rate of accidents reported. Hence, there is a need of a novel approach by which vehicles speed can be automatically controlled. This paper presents a novel approach to control the speed of the automobiles at remote places for fixed time. In this approach, automobile throttle position is controlled not only by Control Unit [CU] also accordingly to one of the inputs received from the accelerator pedal position sensor, but also by a microcontroller unit which receives the pedal position from the sensor and then microcontroller unit transfer to the CU.

The Microcontroller Unit also interfaced is capable of detecting any other trans receiver. Threshold level is set to the pedal sensor which alerts the system by a buzzer sound, when the speed of automobile exceeds the pre-determined value. The microcontroller controls the speed accordingly at desired places. When we deploy, the transmitter sense data frames with field containing maximum speed and time.

Index Terms— Vehicle speed control, microcontroller, pedal sensor, buzzer, threshold, throttle.
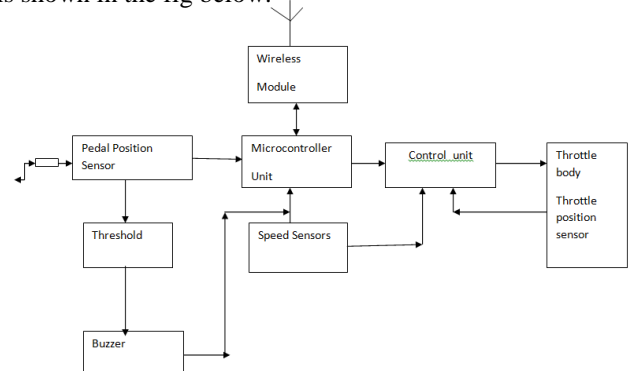
I. INTRODUCTION

It is known that road accidents are increasing day by day. Most of these road accidents are caused because the automobiles are driven at high speeds even in the places where sharp turnings and junctions exits. Running the automobiles even at those places is the main cause for the accidents. Reduction of number Of such accidents is the crime step needed to be taken. Many systems have been developed to prevent these road accidents, one of them is Cruise control system(CC) .Various types of accidents are occurred on express highway road, highway road of road just because of certain activities. Rash driving, system failure, collision due to obstacles , exiting speed control limit etc are just some causes of accidents. In India mostly 65km per /hour limit for highways and below 80km/hour limit for express highways. This develop system is applicable for any speed limit which can be set or controlled as per the roads.

Here we propose a dynamic model where the system controls the speed of the automobile according to the data in the frame that is transmitted by the RF transmitter fixed to the near by poles. This is based on the work done by sato et al. where passive RF transceivers are arranged in the road close to the position of real traffic signals .This model can also be better utilized to improve the fuel efficiency by imposing the maximum speed limit on the automobiles at which the mileage will be more.

Concept On Speed Control Of Automobile:

In general, the speed of the automobile is varied according to the accelerator's Pedal Position is fed to the Control Unit (CU).CU determines the position of the Throttle based on the accelerators Pedal Position and the inputs received from the other sensors. Once the driver has lost Control it is very difficult to drive the vehicle. So to avoid the road accidents and kept the speed control of vehicles is under government, and also to prevent the losing of valuable property, it is necessary to have some safety system which will be the permanent solution for the above problems. Therefore , an innovative concept is suggested by which it can control the speed of vehicle automatically at given limit at particular limiting distance and practically by the developed concept system .If the automobile is in the active mode, Microcontroller transfers the manipulated Pedal Position to the CU that will not increase the automobile speed greater than the maximum speed specified in the data packet. This model is shown in the fig below:

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Pedal Position:

Accelerator Pedal position sensor is fixed to the throttle body of the control system with intelligence. The functional principle to the Sensor involve conversion of the accelerator pedal movement into a voltage signal. The pedal position sensor essentially tells the engine how fast or slow to drive when u press the gas pedal. When you press down or lift off the throttle, it sense an electrical signal to the vehicle's engine Control Unit ,and then transmits the signal to the fuel system.

Microcontroller:

A microcontroller contains one or more CPU's (processor Cores)along with memory and programmable input/output peripherals. Program memory in the form of Ferro Electric RAM, NOR Flash or OTP ROM is also often included on chip as well as the small amount of RAM.

Wireless Module:

An RF module (radio frequency module) is a (usually) small electronic device used to transmit and/or receive radio signals between 2 devices. In an embedded system it is often desirable to communicate with another device wirelessly. RF modules are often used in consumer applications including wireless alarm systems. A module is a self contained component of a system.

Threshold:

Threshold breaking or limit breaking is a driving technique most commonly used in motor racing, but also practiced in road vehicles to slow a vehicle at the maximum rates using the brakes.

Buzzer:

If the driver is driving fast, then the system will give a buzzer signal and the speed of the vehicle is reduced and the obstacle sensor will senses the adjacent vehicle to avoid collision with that, and if there is no vehicle it will go on a normal speed.

Speed Sensors:

A wheel speed sensor or vehicle speed sensor (VSS) is a type of tachometer. It is a sender device used for reading the speed of a vehicle's wheel rotation. It usually consists of a toothed ring and pick up.

Control Unit[Control unit]:

The control unit (CU) is a component of a computer's central processing unit (CPU) that directs the operation of the processor. It is basically made up of hardware and software (firmware). The hardware is basically made up of various electronic components on a PCB. The most important of these components is microcontroller chip that runs in the microcontroller.

Throttle body, Throttle Position Sensor:

The Throttle position Sensor works in similar way of Pedal Position. The Potentiometer wiper is connected to the buffer fly valve spindle. As the pedal or throttle moves, so does the magnet. This movement change the magnetic field strength and thus alters output voltage from the sensor to the CU.

Working model of ASCA:
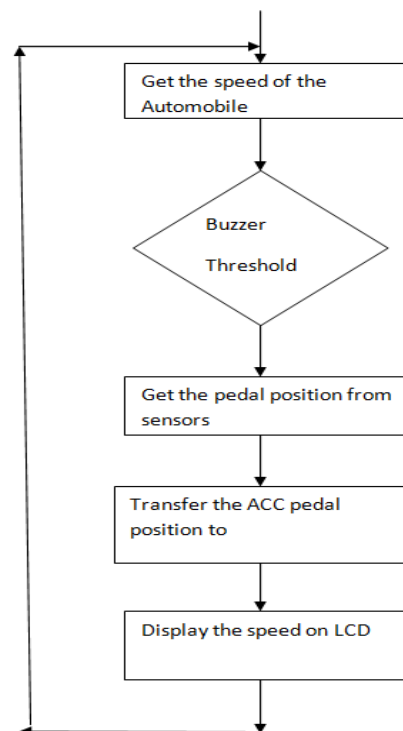
CONCLUSION:

In this paper we presented a new design to control the speed of the automobiles. We have presented a theoretical study on our proposed design. In our study only one vehicle is considered. In normal driving situations, we can expect other vehicles circulating nearby and possibly blocking or attenuating RF signals. In this aspect study more is required.

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