Infra Red Sensor and Voice Recognition Sensors Based Vehicle Speed Control Using Embedded Controller

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Abstract: ***The work reports the embedded controller to control speed of a car or any other vehicle based on the system which implemented Speech Recognition System on a vehicle. The Speech Recognition system should be small in size, less power consumption, lower cost, highly reliable to the real-time implementation. Together with driver circuit at receivers side is build by complete smart intelligent based systems. This system may help to reduce the accident rate drastically in future.***

Keywords: World Health Organization, Steerability, Stability, Slip Ratio

I. INTRODUCTION

Today's life, number of vehicle and users are increasing rapidly every day. By the same instant traffic obstruction, human life and property loss is huge due to accident and it is a worldwide problem. Human life is valuable to everyone. So, we should pay more attention on saving people and their property. Even though more roads, extension of roads, over bridge or any other effort till taken is not help up to the expected level. This difficulty is happened primarily due to manual pouring which takes more reaction time delays, careless and prediction errors(distance and speed of surrounding vehicles) of driver and poor condition of the vehicle break system etc,. Consequentially it may affect the traffic on road and cause accidents. But from the governments side and automobile industry put much effort to make an admirable policy and technical effort in developing systems which will guarantee the safety in transport. With this all existing advancements in vehicle safety systems, the number accidents continuously increase day by day. More than 1.25 million people were loss their life in each year. This recent report is submitted by World Health Organization (WHO) collaborated with World Bank. The majority of accidents are making huge life loss because of the poor breaking systems. Nowadays because of the technological improvement we can implement a smart breaking system with reasonable cost and complexity.

The most imperative system in a vehicle is a break to control the speed. In practice vehicle has a braking mechanism which is operated manually by the driver. Sometimes drivers may apply the beak by a last movement due to their careless. But, sometimes the brake applied is fails and the result will be a disastrous. Consequentially many rear ending vehicles also met with the accidents could have been prevented or at least reduced in damage cost. It can be attain by the rear-ending drivers if applied a sufficient amount of brake pressure at the correct time. Usually it takes reasonable time to the driver's to predict the front vehicles speed and directions change. Drivers may delay to react or apply the brakes in this critical scenario. Typically this is happen due to a delay between the identification of an accident situation and the implementation of the corrective actions. Hence, in such emergency situations an efficient control mechanism has to be employed to control accidents. Above introduction we realized the facts, so we propose an idea to control the speed / stop the vehicle, if any vehicle or obstacles in front and other three side of the vehicle.

II. EXISTING SCENARIO

The current arrangement of programmed vehicle stopping mechanism utilizes the fluffy rationale to apply brake.. It utilizes one ultrasonic sensor put before the vehicle to figure the separation of the deterrent from the vehicle. This plan does not think about the hindrances by the side of the vehicle and has no chance to get of guiding the vehicle when the deterrent is out of crash extend, which could be kept away from. Other existing arrangement of programmed auto stopping mechanism has jumper help capacities. In these frameworks, the driver will be helped to apply the brake when the driver neglects to act in time [4]. This framework will become an integral factor just when the basic circumstance emerges. This plan isn't satisfactory since just driver help is given and no smart move is made even under basic circumstances. This may origin to mischance when the driver neglects to respond in time when the help is given. Highlights of Anti-bolt braking system are as per the following:

i. Reduce in stopping distance ii. Maintain the Vehicle stability iii. Maintain the Vehicle steerability.

Thus the slip ratio is defined by calculating and expressing the locking status of a wheel and is vital to the effectiveness of any anti-lock braking system. The second approach says that two cascaded Mamdani fuzzy controllers are used for collision avoidance and antilock braking.

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III. PROPOSED METHOD

Generally the Speech recognition system made of two most significant. They are feature mining and another one is feature matching. The second module feature extraction is used to convert speech signals in to acceptable format for further analysis and processing. This extracted information is called as feature vector. The signal conditioning unit is used to converting the voice signal to feature vector. From the above block diagram input to front end unit is noise full voice sample and output is feature vector with limited noise. The extracted feature vector from unknown voice sample is scored against acoustic model, the model with max score wins, and its output is considered as recognized word. The Speed variation of vehicle is expressed in terms of fraction, and is called 'slip ratio' is defined by

% Slip ratio =

Vehicle speed – wheel speed x 100

Vehicle speed

To maintaining stability and steerability of the vehicle this parameter is play vital role .Based on slip ratio speed of the wheel variation will be 40, 60, 80, 100% respectively. The duty cycle is calculated by = T_{on}/ T_{on}+ T_{off} and T_{on}+ T_{off} = Total time period of a cycle.

IV. METHODOLOGY

A smart autonomous automatic braking system is a technology for vehicle that experiences a near collision with some other vehicle or obstacle and applies the brake to slow-down the vehicle barring any driver input. By our system we are going to use infrared sensors and sound sensors to detect the obstacles on road. The infrared sensors sense the distance of the vehicles in the four sides of our vehicle. Therefore, by automating the task of assessing the case and deciding the proper amount of brake pressure. Collision shunning may be a tough and difficult action for driving self-governing vehicles. The major challenge is coming up with a crash shunning system is in collisions versus the danger of fake alarms. Usually these sorts of systems square measure called Speech Controlled Automation Systems (SCAS).

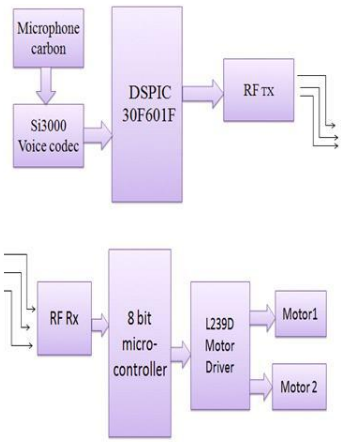

Figure1: The block diagram of Voice recognition module

If noise presents in the received signals, speech enhancement is required to suppress the noise which possible to corrupts the speech signal. By this method we are using more than one microphone have been proposed and tested the results for different samples. All these systems are intended to recover the noise free speech signal by enhancing Signal to Noise Ratio (SNR). [7]

V. RESULT AND DISCUSSION

Herewith, we can conclude that changing duty cycle may change the speed of vehicle wheel also. Wide duty cycle will raise the speed of the vehicle and low duty cycle will adjust the speed is low. The implemented hardware module is shown in the figure2.

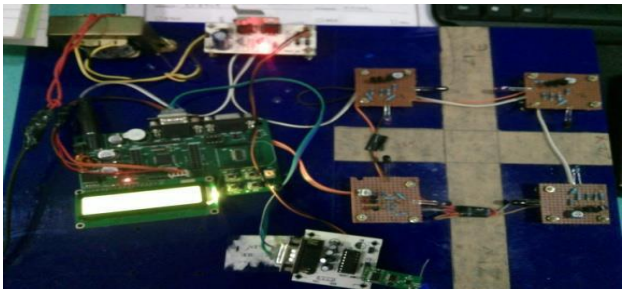

Figure 2: Implemented hardware model

Table1 gives us the information about the existing and proposed systems parameters like stopping time, breaking deceleration and breaking torque. Overall we can conclude that, this system may provide good performance.

Table 1 Evaluation of existing system and proposed system

Measuring Parameters	In Existing System	In Proposed System
Vehicle Stopping time in seconds	14	6
Braking deceleration(m/s^2)	-5.6-5.632	-8.584
Braking Torque (Nm^2)	476.6	505.3

Table 2 conveys us how much break have to apply for the measured voltage levels. Also the break system is activated automatically and controls the speed of the vehicle.

Table 2 Level of break apply for the proposed system

S.No	Threshold value (volts)	% brake apply
1	0-1v	0%
2	1.1v- 2 v	20%
3	2.1v - 3	40%
4	3.1v -4	60%
5	4.1v-4.5v	80%
6	4.5v- 5v	100

VI. CONCLUSION

Speech recognition is installed in within the vehicle and then a respective command is sent to the voice controlled vehicle. Microcontroller fitted on the Vehicle decodes these commands and gives an appropriate command to the motors

connected to the vehicle. With the speedy development of embedded technology, performance of the embedded processor is enhanced into the auto industry, because it is low cost, high reliability. Finally, we can conclude that smart voice based breaking system may save our convincing life in large extent.

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