

Vehicle to Vehicle Communication and Collision Avoidance with Auto breaking System

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Abstract – Vehicle Collision at cross street is very common now days because people are violating the traffic rules that why its cause major accident on road. Car collision are becomes common now days and it brings unnecessary casualties and property losses. System detects risk situation based on the information collected by GPS system. When the following car is in risk of crash, the system will inform or warn the driver that the current speed is not safe, and help drivers to decelerate or brake. With the development of vehicle-to-vehicle communication.

1. INTRODUCTION

As one the type of accident that happened at the cross street, when two car drivers are unable to see each other and if one of them will violate the traffic rule then the accident will occurred at the point of contact of two vehicle. To avoid these types of accident we developed vehicle to vehicle communication and collision avoidance with auto breaking system(VVCABS). The VVCABS system detects risk situation based on the information collected by GPS, censored and map API. When the following car is in risk of crash, the system will inform or warn the driver that the current speed is not safe and help drivers to decelerate or brake. With the development of vehicle-to-vehicle communication a new way to develop the collision avoidance system is put forward. By using the connected vehicles, the system can collect information and share message through the communicate equipment. In this system each vehicle will use GPS signal and then it will store the co-ordinates in system then it will use pi board to calculates the speed and direction then it will transmit the signal over radio frequency. Now next vehicle will receive the signal using RF receiver and fetch the obtained data into the VVCABS system. Now system will calculate the risk of crash and then it will release the warning signal in this communication. This collision avoidance is with some driver behaviour by using a car-following model based on risk perception.

2. MEDICAL AND PSYCHOLOGICAL REASONS BEHIND THE PROPOSED SYSTEM

There are multiple factors usually contribute in car accidents, human errors one of the most common causes of car accidents being, whether due to a medical condition or as a result of recklessness especially for young drivers due to their physiological tolerance characteristics making them driving in an excessive speed as a result of their overconfidence and thrill-

seeking. Speed is an important factor influencing both car crash risk and its consequences (severity of injuries resulting from car collision), many factors associated with the driver's speed choice such as driver himself, road, vehicle and environment. The incidence of car accident shows a 3% increase by every additional increase of 1km/h that's mean the likelihood of death is 20 times more in 80km/h than in speed of 30km/h. keeping the safe distance between cars reduce the probability of being killed due to above mentioned factors. In same point of view, medical pre-existing conditions that affect driving performance and lead to car collision as it contributing up to 8.7% of accidents. In the other hand we can't rely on the driving license as it is not an absolute right for example European standards for vision and driving are amended accordingly. Impaired vision and reduced cognitive are considered the most safety-relevant impairments caused by pre-existing diseases or aging. The mentioned cases are lead to reduce the ability of decision making and timely judgments in traffic situations. Drivers with diabetes mellitus have these impairments due to hyperglycaemia (high level of blood sugar) or hypoglycaemic phenomenon (low levels of blood sugar) as a result of treating the hyperglycaemia with means of insulin which sometimes lead to overcorrect, both mild and severe paper, we introduce a collision avoidance system which is based on the vehicle-to-vehicle journey that to take snacks in case of diabetes type 1 or to check their blood glucose. In this case, the safe distance between cars could help this group of drivers as a secondary prevention way according to the concepts of accident prevention to avoid possible car crashes. On the other side, hypertension (high blood pressure) poses particular danger to car driving due to its. Human brain is capable of performing more than one job at a time, but it cannot be with the same efficiency .Many studies show that multitasking lead to slow down the action and increase the number of mistakes and moreover can temporarily change the way in which brain works. In these days multitasking mind is familiar due to presence of GBS device, digital music players, and sometimes cell phones (as its forbidding while driving) if added to eating or smoking while driving can make the driver distracted and needs help to drive safely by leaving adequate distance particularly in highway roads. Sleepiness either as a result of psychological fatigue such as prolonged working hours or alcohol consumption as they found in German study alcohol as risk factor in 13% of fatal highway crashes. It is documented

that the risk of crash starts to rise significantly from 0.04 g/dl of Blood Alcohol Concentration (BAC). High level of BAC increases the depressant effect on nervous system that leading to reduce attention skills and consequently increase the probability of the accidents [20]. Furthermore, taking some medications may compromise driving more than the medical condition itself, for example Psychoactive drugs which include benzodiazepines (e.g. Valium) that commonly prescribed for anxiety and insomnia, these drugs impair vision, attention, and reaction skills thus, approximately doubles the risk of motor vehicle accidents. Cyclic antidepressant medicine especially amitriptyline and imipramine which prescribed for depression can impair driving skills. Psychoactive drugs like opioid analgesics and antihistamines which can take them without prescription may have effect on driving performance. From the above, we conclude that, medication is a two-edged sword. Starting, changing hypoglycaemia are more common reasons that cause sudden impairment of judgment, so they need an early recognition to take frequent stops during In many cases; the driver may not aware that he didn't leave adequate distance between host vehicle and the front vehicle until the neediness to quick decision. To avoid this state, engineering solution is necessary.

3. SYSTEM DESCRIPTION

The proposed system is used to prevent the collision by use of collision avoidance system. Its prevent the collision with the help of four technique first one is GPS second is radio transmitter and receiver and third one is pi-based risk calculation system, and last is alarm and auto breaking system. Second system is used to detect the collision from rear and side wise, in this we are going to use ultrasonic sensor which can detect the risk of side wise collision. The suitable one of the three mentioned alarms is decided after collecting the current records of the actual speed of the host vehicle, and the actual distance between the host vehicle and its front vehicle. One of the three audio able and visual alarms are demonstrate at a certain time in order to advice the driver to reduce speed of the host vehicle due to short distance with the front vehicle, or to increase the speed in case that the current distance between the two vehicles exceeds the maximum limit, or the third alarm which indicates that you are in suitable distance range and Deciding the safe reference distance through evaluating host vehicle actual speed. It is worthy to mention that the safe reference distance is variable and proportional to the actual speed of the host vehicle with normal 2 second distance. Comparing the difference between the reference distance and the actual distance. you have to keep it. Beside the mentioned three alarm states, the proposed design offers digital demonstration of the reference desired distance in addition to the actual current distance in between. The repeatable steps of data processing for the continuous decision making can be designed as follow;

1. Collecting data of the actual host vehicle speed and the distance between host and front vehicles.

2. Adapting the collected value to be suitable for digitally demonstrated by 7-segments display and to be used for the next processing step.

or combination of medication can impair the driver's ability to drive safely.

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3. Producing and driving the suitable alarming activity and message.

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5. Collecting data of the actual host vehicle speed and the distance between host and front vehicles.

6. Adapting the collected value to be suitable for digitally demonstrated by 7-segments display and to be used for the next processing step.

7. Producing and driving the suitable alarming activity and message.

Figure 1 represents main block diagram of the proposed vehicle safety distance alarming system. The main diagram is consisting of five stages; the first block function is sensing the actual speed of host vehicle and the distance between the host and the front vehicle. The sensed parameters values will enter the second stage for sensed voltages value and range adaptation and manipulation. The adapted data of actual distance and safe reference distance will be displayed through the next stage of data displaying. Reduce speed alarm message, increase speed message, or the host vehicle in the safe distance message that will be determined through the alarm type determining stage. Last stage represents the drive circuit that will generate the visual and/or audio able alarms.

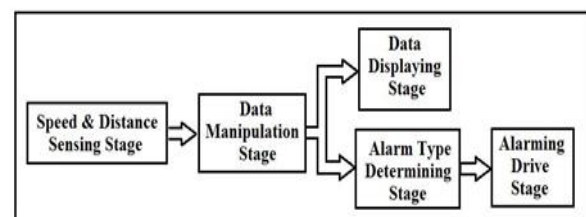


Figure 1 Block-diagram

In this system the data of the speed and location coordinates of the car will be collected by the GPS system and then it will send to the transmitter which going to transmit the signal in the range of 1 Km ,second or host vehicle will going to collects the incoming signal after then the dedicated software will project the path of vehicle using google map api then it will calculate the chances of collision at junction of the road ,if collision is detected ten it will send a warning signal to the driver and ring the warning bell if driver did not override that signal then the auto breaking system will reduce the speed of one vehicle to avoid the collision.

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