An Intelligent Road Traffic Control System for Passenger Safety

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Abstract— Every year, there are a huge number of thruway passings and a huge number of genuine wounds because of "Keep running Off-Road" mischancse. Everything from straightforward driver absentmindedness, to exhaustion, hardness, to inebriated driving, is capable. Basic sensors can be fitted inside vehicles installed with different elements like, programmed crash warning, vehicle security, speed control which can offer catalyst to an effective street wellbeing framework. The elements that are proposed in this work are: Automatic impact notice that offers notice to the casualty's relative, Red light activity control ensures vehicle doesn't break flag, Speed control adjusts speed in various zones, Horn control averts sounding in horn precluded zone, Alcohol recognition distinguishes intoxicated driving and Vehicle security is utilized to counteract burglary.

Keywords-Road safety, Embedded System, Collision Notification, GSM (Global System for Mobile Communication), GPS (Global Positioning System).

I.INTRODUCTION

The advancement of a transportation framework has been the generative power for people to have the most noteworthy human advancement above animals in the earth. Car has an awesome significance in our day by day life. In the present situation, owning different vehicles is viewed as an economic wellbeing in the general public and thusly the quantity of vehicles on the streets has expanded massively in the previous decade. On one hand, this might be viewed as a change in the ways of life of individuals, in this way, it can't be denied that there is a stark increment of street mishaps, air contamination caused by the vehicles and wrongdoings identified with the vehicles like burglary and so forth. We use it to go to our work put, stay in contact with our loved ones, and convey our merchandise. In any case, it can likewise convey fiasco to us and even can murder us through mishaps. Speed is a standout amongst the most vital and fundamental hazard factors in driving. It influences the seriousness of a crash, as well as builds danger of being required in a crash. In spite of numerous endeavors taken by various legislative and non-administrative associations all around the globe by different projects to mindful

against imprudent driving, yet mishaps are occurring from time to time. Be that as it may, many lives could have been spared if the crisis administration could get the crash data in time. All things considered, proficient programmed mishap recognition with a programmed warning to the crisis benefit with the mischance area is a prime need to spare the valuable human life.

II. LITERATURE SURVEY

There are various battles made with a specific end goal to evade mischances i.e., there has been a few mishap aversion framework and portable applications approaches are accessible to trail the lost vehicle. One of the strategies to group the vehicles multifaceted in impact, allowed to trade particulars between the two vehicles at the season of crash [1].This framework had a noteworthy burden on the grounds that the subtle elements are exchanged by means of RFID between the vehicles just, the capacity of vehicle points of interest in database of Cops server or whatever other outer unit wasn't consolidated. The philosophy [2] expound the utilization of Global Positioning System and Zig bee to demonstrate the mishap area to the given contact individual number as a demonstration of giving data about the mischance. This framework approach wasn't genuine since it needs dynamic following of vehicle and capacity of way taken by vehicle and so on., which is the essential need to get the attempt at manslaughter driver. Driver conduct outlining framework [5] utilizes a fastidious rationale to figure the score for unique drivers by giving course topology, climate conditions, and identifies the unverifiable driving occasions and furthermore the likely dangers. So as to recognize the impact in street scenes, a calculation was produced to compute crash conceivable outcomes [6]. This is successful as far as impact cautioning, crash dodging and furthermore moderation. Be that as it may, it doesn't give the help amid its repercussions of mishap. The framework [7] incorporates microcontroller, GPS and GSM to send message about the vehicle collide with the given numbers like rescue vehicle, police headquarters, and so on. This framework [8] which would find vehicle that started attempt at manslaughter mishap and furthermore gives crisis therapeutic help to relieve the fatalities in street

mischances. Therefore the driver who caused mischance prompting damage or demise and left the scene of mishap would be subjected to genuine criminal allegations. The consistent and intervallic checking of the vehicles will lessen the quantity of mishaps in the streets. This framework [9] has mishap evasion innovation which would diminish the mischance of the vehicle in swarm zones. This vehicle mischance evasion, uncovering and mindful frameworks give crisis reaction vital data at the most punctual conceivable time. Dropping the time between when a mischance happens and when it is identified can diminish death rates. This framework [10] composed as a sagacious against robbery framework that utilizes GPS and GSM framework to anticipate burglary and to choose the correct area of vehicle. The framework contains GPS module, GSM modem, Infrared sensors, DTMF decoder IC MT8870DE, 8051 microcontroller, transfer switch, vibration sensor, paint splash and high voltage work. GSM framework is likewise introduced in the vehicle for sending the data to the proprietor of the vehicle since GPS framework can just get the vehicle position data from satellites. This framework consequently sends the message for help to ones relatives. The cautious measures like motor start cut off, fuel supply cut off, electric stun framework (introduced on guiding wheel) and paint shower framework are introduced in the vehicle which is controlled utilizing client or proprietor GSM versatile. The proprietor can bolt or open his/her vehicle with the assistance of SMS. This framework is for low range vehicles to give them extraordinary security. This framework [11] gives the most brief way by controlling activity motions for rescue vehicle. By this framework the time interim is compressed by applying the RF advancements that pedals the activity signals. The priority of administration to the rescue vehicle completes the lining approachs server correspondence. This guarantees the diminished time delay between the mischance area and healing facility. This paper gives the structure which is situated in moving vehicle to identify mischance and answer to In Case of Emergency (ICE). The underlying responder is getting notice through GSM and notwithstanding that the vehicle mischance zone longitude and scope data is acquired through GPS and GPRS. The given framework can spare life as the ICE group achieves the spot on time, deal with the casualty and give therapeutic treatment on time. The black box will accounts the voice of casualty after the mishap happens which will be utilized for assist examination.

Numerous in-vehicle security types of gear like, airbag innovation in which accelerometer is utilized, which distinguish the effect amid impact and air pack get open quickly has been intended to keep away from the death toll and property which happen amid a street mischance and the exploration is still proceed in this field. Yet at the same time street mischances constitute the significant piece of mishap passing on the planet. Nobody can keep the street mischance however the death toll which

happens can be averted if recue is given on time. Postponement in the save operation is the real reason for death in street mischances. There are two noteworthy issues which causes delay in protect operation in street mischance they are:
1. Deferral in Conveying the message to the rescue vehicle and to victim`s family about mishap spot 2. Deferral in achieving the emergency vehicle to the mishap spot and to the healing centre which is caused because of activity conjunction and holding up at the movement signals.

The inspiration driving the venture Travolution is an endeavour to make an installed framework which is to get a positive distinction the field of street security and street teach. The venture handles some real reasons for street mischances, for example, breaking movement signals and tipsy driving. It additionally has a noteworthy target of practicing street train, for example, speed control in various ranges and horn control in horn denied zones. The necessity of installed frameworks is the need of great importance in creating nations and particularly with the dreary measurements of our nation, the need is fast approaching. In this manner consolidation of these elements ought to be compulsory in all autos sooner rather than later without cutting into the client or the maker's pockets. The components included this work are:

Vehicle Speed Control in Variable Zone-in this component, speed of the vehicle is controlled in various regions, for example, flyovers, spans, expressways, schools, urban communities and inside regions. Horn Control of Vehicle in No Honking Zone-Control undesirable unsettling influences in horn disallowed zones, for example, clinics, open libraries, courts, schools and so forth. Red Light Traffic Control-In this component the vehicle is controlled on activity flag, when flag is red the vehicle is consequently ceased. Programmed Collision Notification-In this element when vehicle meet with a mishap, the arrangement of this venture sends messages (SMS) by means of GSM Modem to control room and the closest relative of the casualty. Vehicle security-In this component, if the vehicle is stolen or somebody tries to soften up, burglary sensor is initiated and message is sent to the police control room and to the proprietor if the vehicle by means of GSM modem. Liquor Control-The liquor sensor keeps the start key from working if the driver inhales into it and a huge amount of liquor is identified. Thusly message is sent to the RTO.

III SYSTEM STRUCTURE

The made system makes use of an embedded structure cantered around cloud advancement. An interfacing portable or cloud is linked with the microcontroller, which in term is joined with the motor through transfer. If the vehicle is stolen, the information is sent to the proprietor that some individual has stolen his vehicle. After that the client or proprietor will send the information to cloud or portable which is joined with engine start through exchange or hand-off to turn off the motor. GPS based following framework that monitors the

area of a vehicle and its speed in light of a cell phone content informing framework. The framework can give ongoing text-based notifications to speed and area. The present area can be bolted and the framework will alarm the proprietor if the vehicle is moved from its present bolted area. In each one hour the cloud or portable will educate the proprietor by informing its area as scope, longitude and speed data. The proprietor or client can control or stop the vehicle by essentially sending the message stop to cloud or versatile associated with hardware board. Subsequent to getting that message start framework will kill.

Fig1: Block Diagram

GPS Module:

Stands for "Worldwide Positioning System." GPS is a satellite route framework used to decide the ground position of a question. The Global Positioning System (GPS) is a space based radio-route framework comprising of a group of stars of satellites and a system of ground stations utilized for checking and control. GPS is worked and kept up by the Department of Defence (DOD). The beneficiary gathers information from the satellites and registers its area anyplace on the planet in light of data it gets from the satellites.

Fig.2 GPS Module

MQ3 Alcohol sensor:

This liquor sensor is appropriate for distinguishing liquor focus on your breath, much the same as your normal breathalyzer. It has a high affectability and quick reaction time. Sensor gives a simple resistive yield in view of liquor focus.
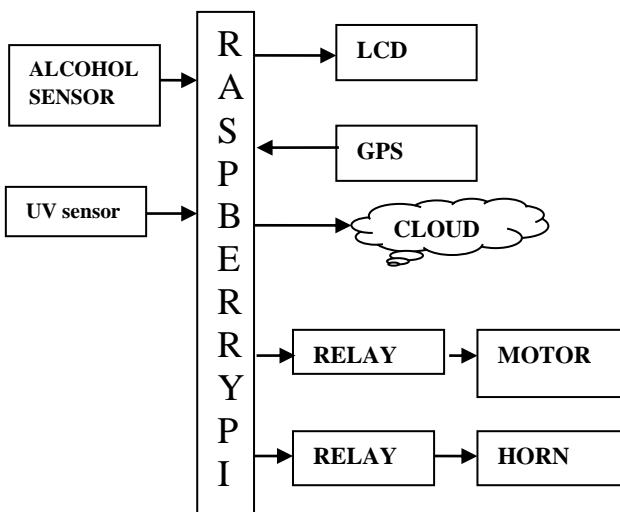

Fig.3 MQ3 Alcohol sensor

Relay Contactor:

Transfers are utilized where it is important to control a circuit by a low-control motion (with finish electrical disconnection amongst control and controlled circuits), or where a few circuits must be controlled by one flag. A kind of transfer that can deal with the high power required to straightforwardly control an electric engine is known as a contractor.

Fig.4 Relay Contactor

Transfers have two arrangements of contacts-regularly open and ordinarily shut. The primary hand-off is associated with the end goal that when it is ordinarily shut, engine works at 12 V and in regularly open it works in 0 V. This hand-off ends the vehicle if there should arise an occurrence of impact location and when liquor is detected by the MQ3 Sensor. The second hand-off is associated with the end goal that when it is regularly shut,

engine works at 6 V and in ordinarily open it works in 0 V. It is utilized when speed restrict condition is receipted by the beneficiary circuit. The auto will move at a large portion of the voltage. The third transfer is utilized for horn control. At the point when horn denial condition is receipted, this present transfer's ordinarily open contact is dynamic along these lines which the bell will go off.

Raspberry pi:

The Raspberry Pi is a charge card measured single-board PC created in the UK by the Raspberry Pi Foundation with the aim of advancing the educating of essential software engineering in schools. It is the center of the entire framework. The employment of Raspberry pi in this framework is preparing extensive amounts of information and furthermore it will keep definite log of vehicles which are in the framework. The Raspberry Pi is a decent decision for a web server that won't get excessively activity and just uses around 5 Watts of energy.

Fig.5 Raspberry pi

IV. RESULTS

A. System Design:

I. System Design

The system consists of three subsystems: input unit (camera, ultrasonic sensor) and processing unit (computer).

II. Input Unit

A Raspberry Pi 3board, attached with a USB camera module and UV sensor is used to collect input data. Two client programs run on Raspberry Pi for streaming colour video and ultrasonic sensor data to the computer via local Wi-Fi connection.

III. Processing Unit

The processing unit (computer) handles multiple tasks: receiving data from Raspberry Pi, neural network training, object detection (stop sign and traffic light), distance measurement (monocular vision).

TCPServer

A multithread TCP server program runs on the computer to receive streamed image frames and ultrasonic data from the Raspberry Pi. Image frames are converted to gray scale and are decoded into dumpy arrays.

B. Collision Avoidance:

For collision detection, UV sensor is utilized. It measures the distance for other vehicles. If the distance measurement is less than predefined one then vehicle automatically stops.

C. Red Light Traffic Control:

A red LED is utilized for showing red movement flag. When it gleams i.e. at the point when switch is put on to show Red Light condition, flag is transmitted to the beneficiary which is given to the microcontroller on the collector circuit. The auto stays in stop position as long as the red LED is on.

D. Speed limit Control:

To control the speed of the toy auto, transfers have been utilized to control the engine. In Normally shut state, Car is driven by the total 12V of the engine. In ordinarily open express the auto is ended on the grounds that engine is conveyed to 0V. Engine will work at 6V if speed restrain condition is transmitted. The transmitter sends the flag alarming that this current zone's speed constrain is 40 KMPH as case. The toy auto at first keeps running in full speed. At the point when this condition is transmitted, the recipient gets the flag, provides for microcontroller which at that point guides the hand-off to decrease the engine speed. In this manner the toy auto keeps running at an unmistakably lesser speed when contrasted with the underlying velocity. In the code written to work the microcontroller, to test this element, 40 KMPH and 20 KMPH have been utilized as cases.

E. Car Theft Detection:

A framework operation is activated when a point of confinement switch is stumbled. At the point when the utmost switch is squeezed, robbery caution is shown on the LCD screen and SMS alongside area of toy auto is given to the number that is pre nourished through internet. In actuality, SMS would be sent to the proprietor of the vehicle alongside the area of the auto.

F. Alcohol Detection:

To test this element, the MQ3 liquor sensor is being presented to a fluid arrangement that has at least 30% liquor content in it. In the event that distinguished, the

bell rings, the auto stops and is shown on the LCD screen. The SMS/mail is sent to the number pre bolstered for this element by means of GSM. "Liquor Sensed" message is likewise shown on the L.C.D.

G. Horn Prohibition:

The database of city is updated in the cloud; it gives the data such as temples and so on. When GPS receiver data matches data available in cloud, the vehicle automatically switch off the horn.

V. CONCLUSION

The proposed system is undoubtedly useful to the everyday citizens. Street mischances are normal in India and additionally in entire over the world. Typically mishap happens in regions which are far from the crisis focuses. So with the assistance of this framework/extend the danger of passing can be diminished to a vast degree.

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