



ROAD SAFETY IN GHAT SECTION

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Abstract: Nowadays people own more than one vehicle for transportation which may cause a problem of high traffic and this will lead to road accidents which is getting increased day by day. There are many dangerous roads present across the world that are very narrow and T roads, hairpin roads, curved roads are largely seen in the ghat areas.

One of the common problems that we face in ghat areas specially is the drivers are not able to see the vehicle that is coming from the other end of the curved road. And if the incoming vehicle is in great speed, it is highly impossible to control the vehicle. Hence there is much need of road safety system. To avoid this vehicle accidents in ghat areas we have proposed a vehicle accident prevention system which makes use of Arduino Board, IR sensors, LED lights, LCD display, GSM and Buzzer. When the vehicle enters from zone 1 of the curved road IR sensor senses the vehicle and turns the LED light into RED colour and raises the buzzer indicating that there is danger. And turns the LED light in to green once the vehicle comes out of the other end which is zone 2. In this way we can prevent the vehicle accidents in ghat areas.

Keywords: Accident prevention, Arduino board, Curved roads, Ghat areas.

I. INTRODUCTION

A rapid growth in transportation and vehicles has resulted in an increase of accidents every day. Accidents mainly occur due to carelessness, breaking traffic rules and bad conditions of the road. As a major component of road geometric design, curved road segment, due to their alignment characteristics are most prone to traffic crashes among all road geometric elements. According to a survey, crashes on curved segments accounted for 10% of total number of traffic crashes. Correspondingly, the number of deaths accounted for 13% of total number of deaths. In Narrow roads, Hilly areas, Ghats sections', negotiating hairpin bends and curves is not an easy task. Driver has to be alert all the time while driving in such situations. Accidents mainly occur due to over speeding of vehicle while driving [1]. While driving on roads at ghat section many drivers faces accident which results them into serious injuries or even death is the main reason behind this accident is curves and bends of roads while turning in ghats. It becomes difficult to see vehicles coming from other lane and turning drivers usually have to assume a way for turning at such critical section [2].

II. EXISTING SYSTEM

In the past, lot of devices to detect rash driving has been made. Most of the approaches require human concentration and involve a lot of effort, which is difficult to implement. Present day automobiles do not have effective lighting system. Due to this many accidents are taking place during night times especially in ghat sections. Conventional Head lights tend to illuminate the side of the road while cornering or shine off the road entirely, which can lead to unsafe condition.

III. PROPOSED SYSTEM

The accidents can be prevented by making use of LED screen, LCD display and Buzzers it will give a clear picture and distinct view of vehicles coming from the other end of the road. It does not make any distraction to drivers while driving. When two cars pass from the opposite side of the curved road the IR sensor senses the car and the LED colour turns into red and raises the buzzer giving danger signal and then the LED colour turns into green to allow the one car to pass and then the other LED colour turns green. Due to the simple techniques it is beneficial to use in large number of places and even in critical cross section of roads. GSM model is used to receive SMS and alert the officer. We have implemented automatic Alert System within fixed limit of period. If the vehicle does not cross the ghat within given time limit then alert message will be sent to the nearest police station. This will solve the problem of those people who will face problem within the ghat section due to landslide, animals or other reason.

IV. SYSTEM DESIGN

System design is the way of describing the architecture, interfaces, and others for a system to fulfill the particular need. System design concentrates on determining which module is needed for the system, the specifications of the given modules that are in the system.

The purpose of the design phase is to plan a solution of the problem specified by the requirement document. The design of a system is perhaps the most critical factor affecting the quality of the software, and has a major impact on the later phases, particularly testing and maintenance. The output of this phase is the design document. The design activity is often divided into two separate phases. They are system design and detailed design. It is one basic approach where issues are solved based on a selection.

Following points are needed while designing the system:

- Rectify data to be extracted.
- List out the user requirements.
- Identity every data for input and output.
- System specification.
- Future benefits of the project in long term.

4.1 HIGH LEVEL DESIGN

High-level design which is sometimes also called system design, aims to identify the modules that should be in the system, the specifications of these modules, and how they interact with each other to produce the desired results. At the end of system design all the major data structures, file formats, output formats, as well as the major modules in the system and their specifications are decided.

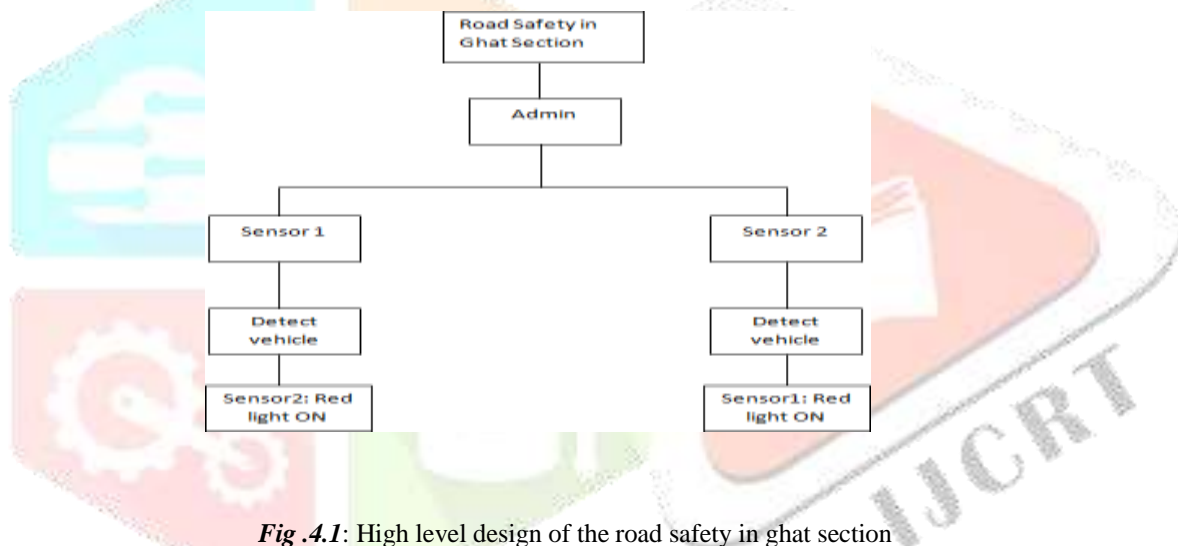


Fig .4.1: High level design of the road safety in ghat section

Figure 4.1 represents the high level design of the road safety in ghat section. Here the admin plays a crucial role. There are two sensors used in the proposed method which are placed in both the sides of the road, sensor 1 and sensor 2. Position of the vehicle is detected by the sensors. As soon as the sensor detects the vehicle from one side of the road the other sensor will alert the vehicle through red lights.

4.2 DETAILED DESIGN

During detailed design the internal logic of each of the modules specified in system design is decided.

Use Case Diagram of Feedback System with Mining

A use case diagram at its simplest is a representation of a user's interaction with the system and depicting the specifications of a use case. A use case diagram can portray the different types of users of a system and the various ways that they interact with the system.

- Use cases :
It explains an order of action that gives meaningful values to actors and it is drawn as a horizontally ellipses.
- Actors :
An actor's is person or externally object which performs the job of communications within the systems.
- System boundary boxed :
A rectangular box is drawn among the Usecase which specifies the objectives of system.
- Association :

The association is the link that is drew among actors and a Usecase. It specifies which actors speak with system to complete the various tasks.

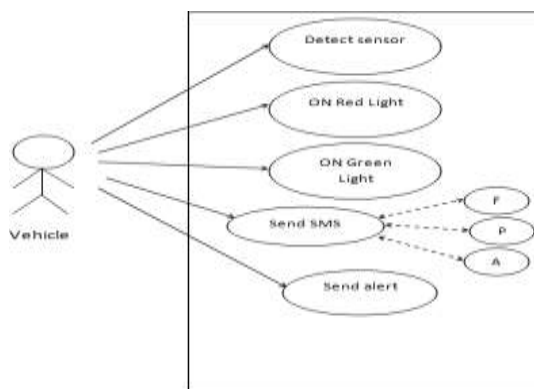


Fig.4.2: Use Case Diagram of Road Safety in Ghat Section

Figure 4.2 represents the process how the vehicle is alerted in the ghat section. First, the vehicle is detected by the sensor which is placed on the ghat roads, the sensor will show LED lights in red colour in order to alert the driver relating to the danger which he might face ahead. Then it changes one LED colour into green to allow the one car to pass. When vehicle is stuck between ghat sections they can send SMS ‘A’, ‘F’ or ‘P’ which calls nearby ambulance, Fire station or police. GSM model is used to receive SMS and alert the officer.

V. IMPLEMENTATION

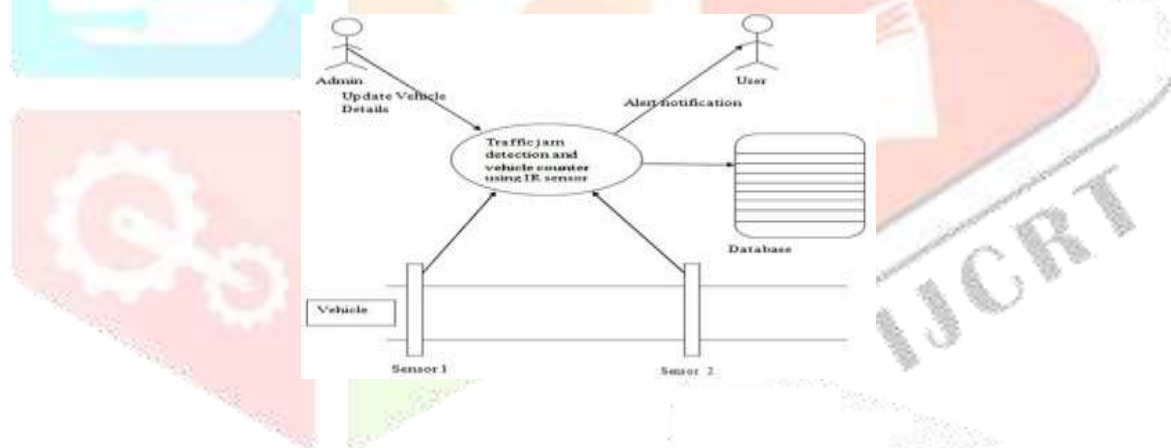


Fig.5: Implementation of Road Safety in Ghat Section

The project is mainly concentrated on the safety of the roads in the ghat section. The current system is followed with the use of two sensors in both the side of the road. Those sensors will detect the vehicle movements and alerts them regarding the danger and other vehicle movements. This application is useful for the safety of vehicle in ghat section as the roads are curvy and narrow and the drivers will find difficult to travel, as shown in the above figure 5.

- There is an IR Sensor attached on both the ends of the ghat road. When a vehicle enters from zone 1 towards the curved ghat section the red light at the other end of the curved zone will be raised. This indicates the driver that there is a vehicle coming from the other end of the ghat road which is zone 2.
- There is an estimated pre set time limit, if the vehicle that enters the zone 1 does not come out of the zone within the time limit, then a buzzer will be raised and a message indicating the same will be sent to the controller. When vehicle is stuck between ghat sections they can send SMS ‘A’, ‘F’ or ‘P’ which calls nearby ambulance, Fire station or police. GSM model is used to receive SMS and alert the officer.

VI. FUTURE DESIGN

- Implementing live visual monitorization to avoid delay in response when incidents happen.
- Making the equipment’s cost efficient to be more user friendly.
- This system requires an external power supply, implementation of a self-powered system using renewable energy like wind and solar will make the system more effective and efficient.

VII. CONCLUSION

The purpose of this paper is to decrease the number of accidents in the ghat section. This is done by alerting the driver by means of LED lights which glows when a vehicle comes from the other side of the curved road. The vehicle is detected by the help of Infrared sensors which is interfaced to the microcontroller Arduino board. By this we can save thousands of lives in the curved roads in ghat section.

VIII. REFERENCES

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