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Safe Driving and Vehicle-to-Vehicle Communication Using IoT

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Abstract: Road accidents are a very common issue nowadays. The fatal road accident leads to a loss of several lives daily. The present innovation is proposed to analyze the same matter and will bring a change accordingly. The road accidents are mainly caused due to the excessive light conditions, drunk and driving, the bad road surfaces, and worse weather conditions. These causes are prime reasons for road accidents. The relationship between fatal rate and other attributes including collision manner, weather, surface condition and drunk driver was investigated. The algorithm discovered association rules and classification model was built. The main purpose of the proposed system is to develop a prototype of an IoT based bike black box. This system can be installed in any vehicle. The system can be implemented with minimum hardware, using a Wi-Fi module for sending the data to the user.

Keywords: Cloud, Controller, Internet of Things, MQ9, Sensors, Wi-Fi.

I. INTRODUCTION

Over 1, 37, 000 people got killed through road accidents, according to the report of the year 2013. These accidents included people of all age groups. From a few months old children to the 90-year-old elders. It is classified with the help of different algorithms.
This system is used to avoid traffics and accidents. So we are developing a web application, in which we are analysing the following parameters such as:

1. Obstacle on the path
2. Car Condition
3. pothole's on the path
4. Drunk Person
5. Velocity
6. Weather Condition

The above information gained from the parameters are sent to the controller. Using this information the controller sends the data to the database or server and provides the information to the specified person.

A. OBJECTIVES

- To identify roads or areas having a high possibility of fatal accidents.
- To easily identify the places where accidents occur due to high light intensity, high speed, weather conditions, car condition and drunk drive detection.
- We are providing a system to analyze some conditions in one system to help minimize road accidents.

B. MOTIVATION

A recent rise in vehicle accidents and loss of lives has motivated us to try and find a solution to this problem. To safeguard drivers by providing them with information about the surroundings. As human beings, we all want to avoid accidents and stay safe. Road fatalities leading to deaths in India are publicly glaring, while road safety is professionally lacking and politically missing.

They apply statistical analysis and data mining algorithms on the fatal accident dataset as an attempt to address this problem. The relationship between fatal rate and other attributes including collision manner, weather, surface condition, and drunk driver was investigated. Association rules were discovered by the Apriori algorithm, the classification model was built using Naive Bayes classifier, and clusters were formed by a simple K-means clustering algorithm. Certain safety driving suggestions were made based on statistics, association rules, classification models, & clusters obtained. [1]

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Association rule mining algorithms are widely used to find all rules in the database satisfying some minimum support and minimum confidence constraints. To decrease the number of generated rules, the adaptation of the association rule mining algorithm to mine only a particular subset of association rules. In the classification, class and an attribute is assigned to the right-hand-side which was investigated in past research. In this research, a dataset about traffic accidents was collected from the Dubai Traffic Department, UAE. After data pre-processing, Apriori and Predictive Apriori algorithm, association rules were applied to the dataset to explore the link between recorded accident factors to accident severity in Dubai. [2]

Collision partner is the key attribute in determining the severity outcome of crashes, but the severity of crashes varies even if the collision partners remain the same. The influence of the other factors on severity outcome may be fixed or random. This study attempts to model the crash severity outcome for vulnerable road users involving crashes, crashes involving passenger cars and crashes involving only heavy vehicles using multinomial and ordered models. The model is developed using data from National Highway-6 (NH-6, West Bengal, India), considering crash time, roadside activity characteristics and road inventory details as contributing factors. The crash severity outcomes are categorized into three categories viz. minor injury crashes, major injury crashes and fatal crashes. The study also attempts to identify factors influencing higher severity crashes. [3]

II. PROPOSED SYSTEM

In the Proposed system, we are analyzing the information security of an authorized user. The hardware part consists of the sensors and they are fixed into the vehicle. This part mainly collects the data from the sensors and saves it to the microcontroller. The main aim of this system is to avoid traffic and prevent accidents. So we are developing a web application, in which we are analyzing the following parameters such as:

1. Detecting the Obstacles on the path
2. Detecting the car condition
3. Detecting the pothole's on the path
4. Detecting a drunk person
5. Detecting the velocity
6. Detecting the weather

A. CUSTOMER FUNCTIONS

- Registration
- Login to application
- View details
- View history

B. ADMINISTRATIVE

- Update details
- View Users

III. SYSTEM ARCHITECTURE

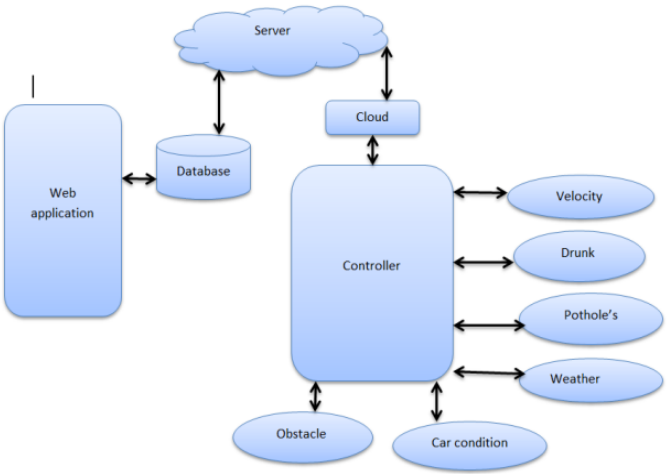

Fig 1. V2V communication system architecture

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IV. THE FLOW OF THE SYSTEM

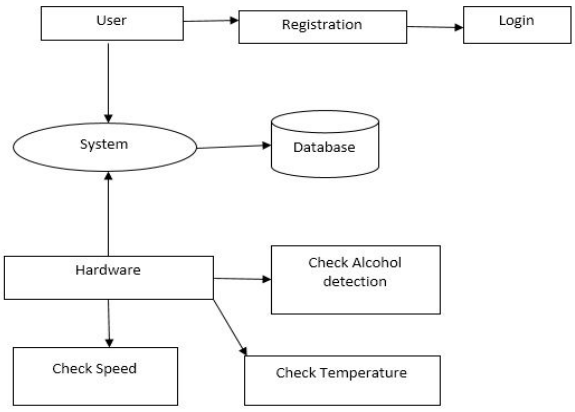

Fig 2. The Flow of the system

V. CONCLUSION

Road traffic accidents continue to be a growing matter, incurring heavy losses of valuable human resources, along with wastage of potential economic growth. In this system, we are getting threshold values of parameters like Light intensity, high speed, weather conditions, car condition, potholes and drunk-driver detection. The existing scenario is we need to get data separately for each condition after that we analyze that data and then get separate results for each condition. Therefore, we minimize our work, developing one system to analyse the data of causing accidents.

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