© 2018 IJSRSET | Volume 4 | Issue 7 | Print ISSN: 2395-1990 | Online ISSN : 2394-4099
Themed Section : Engineering and Technology

Car Following System Using Dataset

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ABSTRACT

This system is about a driving behaviour it is simply called as car following system .As Driving behaviour can be affected by many factors but especially a speed. As in this time people are always in so rush to reach their destinations it may also tends to the major accidents. The proposed system is used to monitor the driver's behaviour to prevent the road accidents or it may help us in some criminal activities on road. It is helps us to improve the important aspects like road safety.

Keywords : car data mining, java, behaviour pattern, dada sets, speed, generic algorithms, longitude, latitude, GHR model.

I. INTRODUCTION

As the numbers of vehicles around us are increasing day by days the number of road accidents are happenings the importance of traffic safety is obvious; traffic accounts for many leads deaths and injuries. Road traffic injuries caused an estimated 1.26milion per year as a result of traffic crash. Thus the measure can be taken researcher has developed several monitoring techniques which monitors either driver behaviour or road conditions using specialized hardware had been installed inside or roadside which is expensive and also requires maintenance.

Our proposed system is all about to follow and determine the speed of the vehicle using dataset. Dataset it mainly contains the following factors these are vehicle identity no, latitude, longitude of the vehicle. Latitude and longitude are important factors for calculating the distance between two vehicles. Proposed system generate a driving pattern depend on the distance covered by the vehicle and the different location. This will help to determine the driving pattern of the driver depending on speed, distance and time. The system uses a dataset and calculates the output depending on given respected input. Also we are using two methods of mapping i.e. segmentation and the clustering. Using of collaborative filtering on datasets will help us to improve the overall accuracy of the system.

II. LITERATURE SURVEY

2.1 Capturing driver behaviour:

To study the relationship between risk understanding and perception, and its impact on risky driving behaviour it is necessary to capture a driving pattern, frequency, time and location of different behaviours and influencing factors. Using Cell Phone Sensors to Analyse Driving Behaviour pattern, Safe Driving Using Cell Phones, Driving Style Recognition using a Smartphone as a Sensor Platform, Analyzing Driver Behaviour using Smartphone Sensors: A Survey, Integrated Computing System for measuring Driver Safety Index, Driver behaviour analysis and route recognition by hidden Mark or models and etc are the methods and algorithms used to captures the driver behaviour using smart phones, GPS etc.

2.2. Review of simulation models:

(Linsen Chong, Montasir M. Abbas, Alejandra Medina, John Janson Olstam, Adreas Tapani, T.V Mathew, M. Pursula, Y. Zang, S.O. Simonson, M. S .Metkari)

Traffic simulations are a most used tool in the research of traffic systems. A traffic simulation model has been classified into several sub models; each model plays an important role in one specific task in the simulation. Car following models use today's most popular car following models AIMSUN. Most popular car-following models have been enclosed in micro simulation software, such as the Pipes model in CORSIM , the Gipps model in AIMSUN, the Fritzsche model in Paramics , and the Wiedemann model in VISSIM. The GHR model uses speed difference and distance between vehicles i.e. space headway as stimuli to compute increasing accelerator of the following vehicle. The Wiedemann model divides headway and speed difference space into several driving regimes with pre defined thresholds, where the following vehicle reacts differently each regime. The Gipps model uses vehicle dynamics as constraints and derives acceleration of the following vehicle from estimated deceleration of the leading vehicle.

2.3. Car-following data collection methods:

Car following system research it most of the cases collect vehicle trajectory data through various means, including naturalistic, simulator, and video data collection methods.

2.4. Car following models:

Car-following models are designed to process various stimuli, such as the distance between two vehicles, and action or reactions of drivers such as the driver decelerating to maintain a certain following distance. The main categories of car following models are action-point or psychophysical models, linear models, nonlinear models, and combination models. Action-point or psychophysical models divide car following periods into different regimes that represent a driver's intended action. For example, a driver intending to follow a lead vehicle will accelerate and decelerate in an attempt to maintain desired following distance. Linear and nonlinear car following models are very similar in that they mainly process the headway and the difference in speed between the lead and following vehicles with some calibration parameters to create the action of the subject vehicle usually in terms of acceleration. Combination models are the car following models that combine the characteristics of both psychophysical and nonlinear or linear models.

GHR model:

We use GHR model in this project. The GHR model is the most well-known car following model. It was developed by Chandler et al. (1958)

$$An(t) = cvmn(t)\{\Delta v(t-\tau)/\Delta xl(t-\tau)\}$$

where

an (t)	acceleration of the subject vehicle at time t;
vn (t)	speed of the subject vehicle at time t;
τ	perception reaction time of the driver;
Δv(t–τ)	relative speed at time t minus τ;
Δx(t–τ)	space headway at time t minus τ;
n	vehicle index of the follower vehicle;
c, l, m	model parameters.

The GHR model relates the acceleration to the current speed, the relative speed, and the space headway. With numerous clusters, the resulting number of calibration parameters is still 120 parameters (4 model parameters times 30 clusters) for car drivers and 120 parameters for truck drivers. The use of more complicated models would potentially decrease the error at the expense of additional complexity.

The GHR model is used in this paper for two purposes. The first is to express the transfer function between states and actions, and the second is to show that the GHR model can improve performance through the application of segmentation and clustering design

method. A genetic algorithm was used to minimize the root-mean square error (RMSE) between the GHR output and the observed data.

III. PROPOSED SYSTEM

This is about the improving the overall accuracy of the driving based on the input dataset as in the existing system, there is no optimum pattern analysis done for the driving patterns, as all the analysis is done based on the rules decided by the researchers. But, this approach does not give an accurate analysis of the driving patterns of the user, in this system we try to get more combinations with the input query this may not be accurate. This will make the pattern faulty, and the actions taken on the basis of this analysis will not be correct too. The proposed system analysis the driving patterns of the drivers. In this approach we apply Genetic Algorithm on the dataset to find the patterns of driving. In this system Genetic algorithm is used to collect the information from the given dataset of the vehicles and it will calculate the solution for the driving patterns. It will track location; Speed of the vehicle as well as the driver's identity no. it improves road safety.

IV. Modularizing the Project

- Datasets Reader
- Pattern
- Module1
- Module2
- Result analysis
- GUI

Datasets Reader

Datasets Reader is use for search detail of car, like car speed, distance travel by car, car driver number, car entry number.

Pattern

In Pattern there is Query of car attributes. In this project there is four query which is driver number, speed of car, distance travel by car, and entry number.

1. COLLECTION OF INPUT DATASET QUERIES

In this module, there is declaration of driver number, latitude i.e. speed of car, longitude i.e. distance travel by car and entry number of car.

2. APPLY ALGORITHUMS AND METHODS TO ANALYSE THE COMBINATIONS FROM THE DATASETS

In this module, there is finding of driver behaviour from driver query. Using given query user can find out driver all information.

3. RESULT ANYLASIS WITH COMPARISSION

Pattern Analysis contain all information and behaviour of diver by analysing all the datasets.

GUI

In Graphics User Interface user can easily communicate with the users. Applied methods and algorithms compare all the query given by the user in the datasets and compare them by using GHR module. From GHR modules there are use to find out large matched fitness score of car. And from fitness score user can get exact behaviour of car

V. CONCLUSION

Car following system using dataset it improves the accuracy of overall system. We have used collaborative filtering of dataset along with segmentation and the clustering. Collaborative filtering is filter approach and a sorting algorithm. It results improve efficiency and effectiveness and also improve accuracy of data.

VI. ACKNOWLEDGEMENT

The authors would like to thank the editors and the anonymous reviewer's foe their insightful and helpful comment and suggestion.

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