Abstract

Because of the scenery on expressways can become monotonous and, letting the drivers easily get tired. And since speed limits are there is restriction of lower speed higher on expressways we must obey, so the speed is higher than usual than on other roads, because of the high speed that the driver’s field of view is getting smaller, and this can allow dangerous driving events to occur more easily. In order to reduce the incidence of dangerous driving events, this paper proposes a system which uses relational maps to predict any occurrence of dangerous driving events that could happen, according to three factors: driver behavior, the nearby vehicles factor and the roadway itself factor. Warning the driver when the dangerous driving events might happen should reduce the incidence of dangerous driving events.

In order to compose an accurate driving relational map, the system requires the input of these three factors: driver behavior, the nearby vehicles factor and the roadway factors. This map represents a driving event, and this map can continue to grow as the time progresses. At first, the system will match these relational maps against pre-existing, there are...
many dangerous driving relational maps in the database, the system will do matching process as the system decomposes the driving relational map. If a driving relational map is very similar to one of the dangerous driving relational maps and the driving relational map are very similar, meaning then the a dangerous driving event might happen occur in the future, and so thus the system should warn the driver in order to avoid dangerous driving events the dangerous driving event to happen. If one of the dangerous driving event s happens …

Comment [SM1]: CHECK:
“Happen in the future” sounds like it could be in a fairly distant time to come, rather than something urgent. I’d suggest writing instead something like “…dangerous driving event is imminent, so the system …” or (to be less dramatic) “could be about to occur, so the system ….”
Chapter 1

Introduction

The development of active driver assistance systems (ADAS), which is a derivative form one kind of an intelligent assistance systems, has been a hot popular research topic in recent times. An ADAS can avoid–prevent traffic accidents by warning drivers to pay attention to the dangerous situations. An ADAS has and it can be classified into four components, which are shown as follows:

1) Detection component: The detection subsystems included in this component are used to collect the data outside the vehicle. The subsystems work independently to each other and then output the detection results to the analysis components.

2) Coordination component: A coordination subsystem is able to coordinate all detection subsystems, including assigning their operation priority and recording their operation process.

3) Analysis component: The analysis component includes a driving event analysis subsystem which can analyze the data the detection results coming from the detection components and decide which situations drivers are in, by the use of decision making techniques.

4) Prediction component: A prediction subsystem plays an important role in an ADAS. It can predict dangerous situations in advance. Since the-prediction results can be verified after the situations occurring, we can design a learning strategy in–for the prediction subsystem to increase–improve its performance.

Comment [SM2]: Check. Are the words “active-driver” usually hyphenated? If so, this will need to be changed throughout the document.
Chapter 2

The Architecture of this System

2.1 The Purpose of this System

There are all kinds of driving factors might happen be involved on expressways. These can be we could induct driving factors allocated to three main categories; the driver behavior, of drivers factor, the nearby vehicles factor and the roadway factors. We can compose a driving relational map if we regard each driving factor as a node and add the conditions of the sequence of each driving factor. So the driving relational map will represent a driving event and records the sequence of each driving factor. The purpose of such a system is to predict whether dangerous driving events will happen or not, basing on the driving relational map.

The database will first become populated with dangerous driving relational maps at first, when the system wants and, to predict dangerous driving events; it will then matching them against driving relational maps with each of the dangerous driving relational maps in the database. If the similarity between two relational maps is higher than a certain threshold, meaning then a that the similar dangerous case might happen in the future be imminent, So the system can warn the driver, thus reducing the likelihood to achieve the goal of reducing the incidence of a dangerous driving events.
Chapter 3

Weighted Driving Relational Maps

3.1 Weighting Driving Relational Maps

The way–method of composing driving relational maps has been described in told at section 2.2.3. In this section we will introduce how to weight the importance of each node and the relations between the adjacent nodes in the driving relational map, so as to generate the weighted driving relational map.

![Diagram](image)

Figure 3.1: (a) DA-driving relational map (b) WA-weighted driving relational map.
Chapter 5

Conclusion and Future Work

5.1 Conclusion

The purpose of this system is to reduce the rate of the dangerous events caused by the continuous various driving factors. We will compose a driving relational map as the system gets inputs factors of the driver behavior, driver’s factor, the nearby vehicles factor and the roadway factors, and then taking put this driving relational map and the dangerous driving relational maps into the matching process with dangerous driving relational maps. If the similarity between the driving relational map and one of the dangerous driving relational maps from the matching process is high, it might happen this kind of a dangerous event may occur in the future. At this time the system will warn the driver to watch out for this dangerous event. Along with the learning process based on the case-base reasoning, the system will become a flawless dangerous prediction system.

5.2 Future Work

Although this dangerous prediction system danger prediction system has in simulation, proven capable of already predicting dangerous driving events using a weighted relational map which is based on the host vehicle, nearby vehicles and the roadway conditions, there are still some aspects that should be improved.

Comment [SM4]: Check. “Flawless” is quite a strong, absolute statement in English. An alternative would be to write “highly effective and flexible”, “very reliable”, or some other term. Using ‘flawless’ assumes this system will never make mistakes.