



Detection of Distracted Car Drivers using Convolutional Neural Network

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Abstract : According to survey report on the internet, the road accident cases are increasing exponentially. Most of the accident cases are due to distraction of drivers, over speed, panic attacks of drivers. We are proposing a system that will take control of the vehicle system if the driver is distracted. The existing system uses a sensor based indication or Recurrent Neural Network (RNN) installed semi self driving cars. The proposed system uses Convolutional Neural Networks to understand the behaviour of the driver and the environment. Naturalistic data collection of ten drivers is being collected and are treated as a qualifying dataset.

Index Terms: Distracted drivers, prediction, performance

I. INTRODUCTION

The distraction of drivers has led to many accidents in the recent days. The use of mobile phones while driving, Navigation and music systems of the car can cause distraction to the drivers which can lead to many accidents. The best way to avoid this problem is to develop the information system of the car that can detect the distraction level of the driver and can act according to the distraction level of the car driver. The driver's distraction level can be measured using the visual pattern and psychological behaviour. The distraction level can be used to take control over the information system built within the vehicle

Existing System

The existing system uses the following methods for DD measurement and detection

Behavioral:

The behavioural attribute measures the driver's distraction on the basis of the behaviour of the driver. for example, head and eye movement are behaviors used to measure the driver's distraction

Performance-based:

The distraction level is derived from the driver's performance. These includes vehicle lateral and longitudinal control, vehicle speed, lane offset of the vehicle

Psychological:

The distraction level of the driver is calculated on the basis of drivers psychology using electrocardio and electroencephalographical methods

Subjective: The drive distraction level is calculated subjective to self assessed set of questions. surveys and expert evaluations

Disadvantages Of Existing System

- The existing system needs cameras and neuro-scan systems
- The existing system uses only Boolean classification
- The tracking of eye movements are inadequate to spot the driver's cognitive volume.
- The dynamics of the vehicle are not considered by the existing system

II. PROPOSED SYSTEM

The goal of this paper is to propose a system, finds and assesses a Driver Distraction level of each separate driver for the safe design of VEHICLE INFORMATION SYSTEM. To make this possible, a regression problem of the Distracted Driver detection is answered targeting to derive the outcome as an accurate number using the machine learning. The level of the impact of the secondary task on the driver's performance is measured accurately. The Distracted Driver detection is calculated using Non-linear regression based on Euclidean distance (ED). Fuzzy logic (FL) is used for the combination of vehicle performance data to arrange a level of DD from two independent variables. An experiment on Distracted Driver detection and evaluation was done, in which, texting and driving was selected as a secondary distractive activity that needs a number of modes of distraction simultaneously. Hence, a dissimilarity in vehicle performance at driving without any distraction(primary activity) and achieving a second task while driving(distracted) was noticed to approximate the secondary tasks effect on the driver while driving

Advantages Of Proposed System

- The proposed system does not require any hardware cost
- The proposed system uses not only Boolean classification but also binary classification
- The dynamics of the Vehicle are considered by the proposed system

Manuscript received on March 15, 2020.

Revised Manuscript received on March 24, 2020.

Manuscript published on March 30, 2020.

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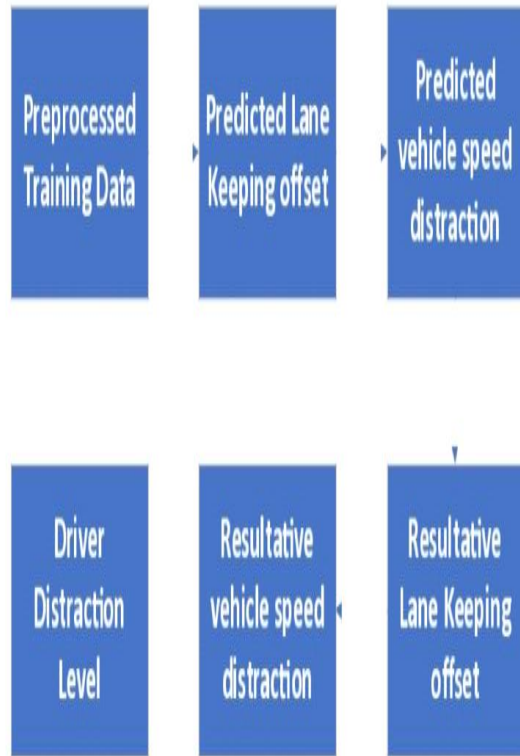
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Architecture



III. LIST OF MODULES:

- 1) Data Evaluation
- 2) Data Pre-processing
- 3) Feature selection
- 4) Prediction

IV. MODULES EXPLANATION:

1: Data Evaluation

The data evaluation is used to examine the data set without assuming anything that can be contained within the data. The data evaluation can be used to recognize patterns and potential causes for behaviours. The evaluated data must have correct technical assumptions for giving the best and accurate results

2: Data Pre-processing

The data pre-processing method is used to process the dataset. "A dataset is a collection of data objects". Data objects are created by a number of features, that express the basic attributes of an object. The features are either categorical or numerical

3: Feature Selection

Feature selection is the method of selecting the features that has high rate of success and also removing the input variables that are not relevant to improve the performance and storage space of the system. There are two types of feature selection : Filter based selection and wrapper selection. The features are selected by creating a connection between each input variable and the target variable using correlation stats and selecting the input variables that have the well built association with the target variable.

4: Prediction

Prediction refers to the trained algorithm on a old dataset and applied to new data when predicting the possibility of a particular outcome. The data must be optimized and generalized which means that the data should give the best possible outcome and perform well on unknown data. The trained data predicts the output on the basis of the pattern of the datasets

CONCLUSION

The proposed system increases the efficiency of the In Vehicle Information system by considering the dynamics of the vehicle and also by cutting out the hardware costs. The future enhancements includes taking control of the vehicle system entirely without harming the passenger and vehicle behind and in front of the driver and safely parking the vehicle. The use of convolutional neural network will enable the automation of the In Vehicle Information Systems . The proposed system prevents the accident of vehicles caused by the drivers who are distracted and also measures the level of distraction.

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