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Driver Drowsiness Detection System

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***Abstract* - This report considers an overview of speech recognition technology, Software development, and its applications. The first section deals with the description of speech recognition process, its applications in different sectors, its flaws and finally the future of technology. Later part ofreport covers the speech recognition process, and the code for the software and it is working. Speech Recognition is the process of automatically recognizing a certain word spoken by a particular speaker based on individual information included in speech waves. In this project, we will use algorithms for the speech recognition which will implement on JAVA for platform independent facility this system can be used for any security system in which the person authentication is required.**

Keywords: Speech recognition, signal processing, Driver, Drowsiness.

1. Introduction

Driver fatigue is when a driver's ability to drive safely is reduced as a result of being physically or mentally tired or sleepy. Driver fatigue or is a significant safety hazard for the road transport industry. The main causes of 'drowsy driving' are too little sleep, driving at times when you would normally be asleep and working or being awake for very long hours. To detect driver drowsiness can be classified into three categories:

1) Vehicle-based approaches,
2) Behavior-based approaches, and
3) Physiological-signal based approaches.

In physiological approaches, the physiological signals from a body, such as electroencephalogram (EEG) for brain activity, electrooculogram (EOG) for eye movement, and electrocardiogram (ECG) for heart rate, are evaluated to detect driver drowsiness.

Recent studies show that the methods using physiological signals (specially the EEG signal) can achieve better reliability and accuracy of driver drowsiness detection compared to other methods. FATIGUE, drowsiness and sleepiness are often used synonymously in driving state description. Involving multiple human factors, it is multidimensional in nature that researchers have found difficult to define over past decades despite the ambiguity surrounding fatigue; it is a critical factor for driving safety. Studies have shown that fatigue is one of the leading contributing factors in traffic accidents worldwide. It will be also uses alcohole pulse detection to check out the person is normal or abnormal. It is particularly critical for occupational drivers, such as drivers of buses and heavy trucks, due to the fact that they may have to work over a prolonged duration of the driving task, during the peak drowsiness periods.

2. Problem Statement

- When it comes to knowledge of the risk of falling asleep, the drivers were confronted with several statements concerning characteristics of drivers who fall asleep (age, sex, physical condition, sleeping problems) in addition to a statement that falling asleep can happen to anyone. Based on the drivers' evaluation of these statements, it seems to be a general agreement among them, both private and professionals, that falling asleep can happen to anyone. In addition, they seem to have good knowledge of the actual risk of falling asleep while driving. The private drivers and the professional drivers respectively assume that an average of 40 and 36 drivers out of a hundred drivers have experienced falling asleep while driving. Calculated in percent these numbers makes up shares that are close to the actual proportions found in this study. It will be also uses alcohol pulse detection to check out the person is normal or abnormal.
- Hence, the knowledge of the actual risk of falling asleep among drivers seems to be quite good.

3. Proposed System

The proposed system is a driver face monitoring system that can detect driver hypo vigilance (both fatigue and distraction) by processing of eye and face regions. After image acquisition, face detection is the first stage of processing. Then, symptoms of hypo vigilance are extracted from face image. However, an explicit eye detection stage is not used to determine the eye in the face, but some of important symptoms related to eye region (top-half segment of the face) are extracted reforming the face detection algorithm for all frames is computationally complex. It will be also uses alcohole pulse detection to check out the person is normal or

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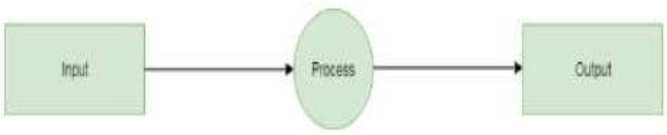
abnormal. Therefore, after face detection in the first frame, face tracking algorithms are used to track driver face in the next frames unless the face is lost.

4. System Design

System Architecture

Data Flow Diagram

In Data Flow Diagram, we Show that flow of data in our system in DFD0 we show that base DFD in which rectangle present input as well as output and circle show our system, in DFD1 we show actual input and actual output of system input of our system is text or image and output is rumor detected likewise in DFD 2 we present operation of user as well as admin.



UML Diagram

Following diagram shows the UML Diagram of this system.

1) Usecase Diagram
2) Activity Diagram
3) Sequence Diagram
4) Class Diagram

5. Technical Requirements

Hardware Requirements

- Hardware: Camera
- RAM: 8GB
- Key Board: Standard Windows Keyboard

Software Requirements

- Operating System: Windows 7 0r windows 10
- IDE: Anaconda, spyder
- Programming Language: Python

6. Conclusion

The increasing number of traffic accidents due to a diminished driver's vigilance level has become a serious problem for society. Statistics show that 20 percent of all the traffic accidents are due to drivers with a diminished vigilance level. Furthermore, accidents related to driver hypo-vigilance are more serious than other types of accidents, since sleepy drivers often do not take correct action prior to a collision.

For this reason, developing systems for monitoring driver's level of vigilance and alerting the driver, when he is drowsy and not paying adequate attention to the road, is essential to prevent accidents. The prevention of such accidents is a major focus of effort in the field of active safety research. People in fatigue show some visual behaviors easily observable from changes in their facial features like eyes, head, mouth and face. Computer vision can be a natural and non intrusive technique to monitor driver's vigilance. Faces as the primary part of human communication have been a research target in computer vision for a long time. The driver fatigue detection is considered as one of the most prospective commercial applications of automatic facial expression recognition.

Automatic recognition (or analysis) of facial expression consists of three levels of tasks: face detection, facial expression information extraction, and expression classification. In these tasks, the information extraction is the main issue for the feature based facial expression recognition from an image sequence. It involves detection, identification and tracking facial feature points under different illuminations, face orientations and facial expressions.

7. Future Scope

- The driver fatigue is the major problem in today's world, because due to the downiness problem day by day accidents are increased. In the future work it further implemented with the help of Neural Network and other

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real time sensor devices. So that more accuracy is achieved.

- For school bus driver the system was very useful.
- It will be also uses alcohole pulse detection to check out the person is normal or abnormal.

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