DRIVER DROWSINESS DETECTION TO REDUCE THE MAJOR ROAD ACCIDENTS IN AUTOMOTIVE VEHICLES

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INTRODUCTION: Automotive population is increasing exponentially in the country. The biggest problem regarding the increased traffic is the raise in number of road accidents. Road accidents are undoubtedly a global menace in our country. The global status report on road safety published by the World Health Organization (WHO) identified the major causes of road accidents are due to driver errors and carelessness. Driver sleepiness, alcoholism and carelessness are the key players in accident scenario. The fatalities and associated expenses as a result of road accidents are very serious problems. Figure 1 shows driver drowsiness.

Figure 1:- Driver drowsiness

OBJECTIVES:

- Driver drowsiness detection is a car safety technology which helps to save the life of the driver by preventing accidents when the driver is getting drowsy.
- The main objective is to first design a system to detect driver's drowsiness by continuously monitoring retina of the eye.
- The system works in spite of driver wearing spectacles and in various lighting conditions.
- To alert the driver on the detection of drowsiness by using buzzer or alarm.
- Speed of the vehicle can be reduced.
- Traffic management can be maintained by reducing the accidents.

METHODOLOGY:

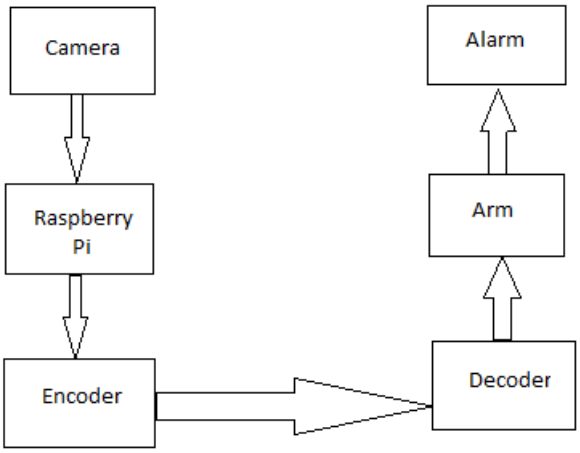

Figure 2: System Architecture of Driver Drowsiness Detection System

- **Hardware Requirements:-** Raspberry Pi board, LPC2148, L293D, Transmitter, Receiver, Camera, Monitor, Alarm, Mouse, Keyboard.

- **Software Requirements:-** Open CV, Ubuntu, Raspbian Software.

- The block diagram of the proposed system has been shown in the above Figure1. The camera captures the image and sends to the Raspberry pi which consists of 32 bit memory card installed with Open CV which helps in image processing.ARM used is the LPC2148 which is the microcontroller. If the signal crosses threshold of 2 sec, it will automatically makes the alarm beep and the speed of the vehicle gets reduced. Otherwise that signal is rejected and next signal is processed.

- **Working:-** Drivers face is continuously monitored using a video camera. In order to detect the drowsiness the first step is to detect the face using the series of frame shots taken by the camera. Then the location of the eyes is detected and retina of the eye is

continuously monitored. The captured image is sent to the Raspberry Pi board for image processing. The raspberry Pi converts the received image to digital signal using Open CV. The digital signal is transmitted from transmitter to the receiver. Both the transmitter and the receiver are paired up. The signal is then passed to the LPC2148, the microcontroller. If the signal crosses the threshold of two seconds, then the alarm beeps and the speed of the vehicle is automatically reduced.

RESULTS AND CONCLUSIONS: The drowsiness detection and correction system developed is capable of detecting drowsiness in a rapid manner. The system which can differentiate normal eye blink and drowsiness which can prevent the driver from entering the state of sleepiness while driving. The system works well even in case of drivers wearing spectacles and under low light conditions also. During the monitoring, the system is able to decide if the eyes are opened or closed. When the eyes have been closed for about two seconds, the alarm beeps to alert the driver and the speed of the vehicle is reduced. By doing this many accidents will reduced and provides safe life to the driver and vehicle safety. A system for driver safety and car security is presented only in the luxurious costly cars. Using drowsiness detection system, driver safety can be implemented in normal cars also.

SCOPE FOR FUTURE WORK: The future works may focus on the utilization of outer factors such as vehicle states, sleeping hours, weather conditions, mechanical data, etc, for fatigue measurement. Driver drowsiness pose a major threat to highway safety, and the problem is particularly severe for commercial motor vehicle operators. Twenty-four hour operations, high annual mileage, exposure to challenging environmental conditions, and demanding work schedules all contribute to this serious safety issue. Monitoring the driver’s state of drowsiness and vigilance and providing feedback on their condition so that they can take appropriate action is one crucial step in a series of preventive measures necessary to address this problem. Currently there is not adjustment in zoom or direction of the camera during operation. Future work may be to automatically zoom in on the eyes once they are localized.