# Artificial Intelligence-Based Drowsiness Detection

Jagadesh T Department of ECE KPR Institute of Engineering and Technology Coimbatore, India jagadesh.t@kpriet.ac.in

J Dhanasekar Department of ECE Sri Eshwar College of Engineering Coimbatore, India dsekarj@gmail.com Balamurugan K Department of EEE KPR Institute of Engineering and Technology Coimbatore, India balamurugan.k@kpriet.ac.in

B.Gomathy Department of CSE PSG Institute of Technology and Applied Research Coimbatore, India gomramesh@gmail.com Kowsalya P Department of ECE Info Institute of Engineering Coimbatore, India kowsiece2024@gmail.com

Ayodeji Olalekan Salau Department of Electrical/Electronics and Computer Engineering, Afe Babalola University, Ado-Ekiti, Nigeria; Saveetha School of Engineering, Saveetha Institute of Medical and Technical Sciences, Chennai, India ayodejisalau98@gmail.com

SatheeshKumar Palanisamy Department of ECE, BMS Institute of Technology & Management, Yelahanka, Bengaluru, India. satheeshp@bmsit.in

Abstract—The physical and psychological demands of driving need the highest level of focus, making it the most dangerous employment. The spectrum of accidents related to tiredness in the modern era is complicated. Determining whether driver fatigue plays a role in accidents and the degree of physical and psychological discomfort that the drivers experienced is a difficult task without a tried-and-true method. Hence automatic drowsiness detection has become a major challenge froma research perspective. In this research, drowsiness detection has been implemented using Artificial Intelligence (AI). The method is derived by combining information from the image and data/log to provide a capable process for detecting sleepiness. This is supported by testing using many drivers with diverse environments to make the perfect method.

Keywords—Drowsiness Detection, AI, Current Sensor, Voltage Sensor

#### I. INTRODUCTION

Sleepiness also referred to as drowsiness and fatigue, can be explained as "they want to go down to sleep". This method depends on the ordinary human being eyebrows condition, which consists of the sleep period. Drowsy detection is mandatory to detect the drowsy it is essentially needed to drive from one place to another place during driving to avoid accidents. Whenever drowsy detection is used perfectly extracting relevant information from a system. When information in an image is done effectively, then subsequent processing like identification, and detection of the eye becomes easier.

Driving is one of the riskiest jobs since it requires complete physical and mental concentration. The driver's life won't be in danger when alertness, awareness, and lack of tiredness are required. Despite this fatigue, there are a lot of factors that contribute to car crashes, including the driving skill of the driver, the road taken, the weather, and the condition of the vehicle. Joint restiveness, non-quick eye progress, and quick eye progress are the three forms of drowsiness that are stated. When the middle awakens due to sleepiness, catastrophic accidents can occur. The error happens when someone is sleepy or unaware of their surroundings and is unable to make an accurate decision on the way before running into the damage of the car. Preventing driver drowsiness is the basic principle behind this concept. Driving over extended periods of time makes you sleepy, and this leads directly to accidents on the highway.

### II EXISTING SYSTEM

Drawbacks of existing system techniques for sleepiness detection are discussed below

A. EEG (Electroencephalogram)

An EEG especially for drowsy recognition methods, calculates the action in the middle nervous method. However, EEG needs the use of electrodes to be attached to the body, which makes it extremely unreasonable, and poor accuracy, and takes time to detect drowsiness. It is insufficient to wear while driving. [14]

# B. ECG (Electrocardiogram)

An ECG was developed for drowsy recognition methods; it calculates the action in the heartbeatand pulse method. However, ECG needs the use of electrodes to be attached to the body, which makes it extremely unreasonable and poor and false accuracy most of the time and takes time to detect drowsiness. It is insufficient to wear while driving. [14]

C. Vehicle-based Drowsy Detection

Vehicle-based drowsy detection capture vehicle method might give the results below positive situation. Changes in climate conditions, alteration specs, point of view of the vehicle, and extra situations can badly shape the image used by image detection methods and most of the time takes time to detect drowsiness.

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## D. Behavioral-based Drowsy Detection

A behavioral-based drowsy detection was developed for drowsy recognition methods; it calculates the action in the head, mouth, and expression methods. It is particularly unreasonable has poor and false accuracy most of the time and takes time to detect drowsiness. It is insufficient to wear while driving.

#### E. Video-based Detection

Eyelid progress might also give good recognition results. But the capture eyelid method might give the results below positive situation. Changes in brightness conditions, alteration specs, point of view of the eye, and extra situations can badly shape the image used by image detection methods.



Figure 1. Block Diagram of the proposed system

## II. SYSTEM METHODOLOGY

## A. NodeMCU

The proposed methodology is shown in Fig. 1. The NodeMCU [5] is a low-cost, freely accessible IoT platform as shown in Fig. 2. Its original hardware components included ESP-12 modules and firmware based on the ESP8266 Wi-Fi SoC [6]. Support for the 32-bit ESP32 MCU was added in later releases. The NodeMCU Dev Kit/Board contains the ESP8266 WiFi chip. The TCP/IP protocol is utilized by Espressif Systems' low-cost ESP8266 Wi-Fi module. Learn more about the ESP8266 using the WiFi Module.



Fig 2. NodeMCU

#### A. Web Cam

Without downloading the software that is provided with cameras on their PC, users are unable to record or stream video over the Internet. Webcams may record high-definition videos and still images even if their video quality may be lower than that of other types of cameras. A webcam, or tiny digital video camera, maybe simply linked to a Raspberry Pi computer. It is an input tool for digital picture capturing. As shown in Fig. 3, this work used a Web cam for capturing the obstacle images, which are present outdoors and indoors with the help of a web camera.



Fig 3. Web Cam

#### B. Stepdown transformer

An electrical device known as a step-down transformer is employed to reduce the voltage of an AC signal. It is made up of two or more wire coils twisted around a common core and is frequently made of laminated iron as shown in Fig.4. The coil with less turns, known as the secondary coil, generates the output voltage, while the coil with more turns, known as the primary coil, is connected to the input voltage source. In order to reduce high voltage from transmission lines to safer levels so that buildings and appliances may use them, step-down transformers are frequently used in power

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The plan of this section driver sleepiness caution plans is to test, IoT device examination to the drivers that their attentiveness is effectively compatibly tested and trained with the projected impact of the sleepiness on their driving capability all determined. If the cautions occur early enough in the progress of sleepiness before starting the vehicle, the procedure might improve driver attentiveness enough to avoid an accident, through the new design and complete product of driver sleepiness method, extra acceptance is predictable about caution the driver before they get into level of sleepiness or drowsiness. It is known that a driver's basic, reliable technology can be used to test and instruct them in driving while sleep deprived.

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