IJNRD.ORG ISSN : 2456-4184
INTERNATIONAL JOURNAL OF NOVEL RESEARCH AND DEVELOPMENT (IJNRD) | IJNRD.ORG
An International Open Access, Peer-reviewed, Refereed Journal

ADVANCED DRIVER ASSISTANCE SYSTEM

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ABSTRACT

The advanced driver assistance system proposes real time detection of drivers using python - open cv. Continuous advancements in computing technology and artificial intelligence in the past decade have led to improvements in driver monitoring systems. Drowsiness is a significant cause of accidents, with studies finding that loss of concentration is responsible for 25% of road accidents. Preventing drowsy drivers from getting behind the wheel is important. Numerous experimental studies have collected real driver drowsiness data and applied various artificial intelligence algorithms and feature combinations with the goal of significantly enhancing the performance of these systems in real-time.

1. INTRODUCTION

We explore the feasibility of machine learning technology in the normal cars to enable the safety measures for the driver while driving a car. Advanced Driver Assistance Systems (ADAS) represent a transformative leap in automotive technology, aiming to enhance vehicle safety, improve driving comfort, and pave the way for autonomous driving. ADAS incorporates a suite of sensors, cameras, radar, lidar, and other technologies to assist the driver in various aspects of vehicle operation. These systems leverage sophisticated algorithms and real-time data processing to provide a more

intuitive and responsive driving experience.
The primary goals of ADAS include reducing the likelihood of accidents, minimizing the severity of collisions, and enhancing overall road safety. These systems are designed to assist drivers in making informed decisions, mitigating potential hazards, and providing an additional layer of awareness in complex driving scenarios. Drowsiness detection works to prevent accidents created by microsleep, fatigue and lack of attention. Driver drowsiness detection systems generally come as one tool, one part of Advanced Driver Assistance Systems (ADAS).

2.LITERATURE SURVEY

In every country, road traffic accidents are a major public health problem and cause huge societal and financial burdens. Sleepiness causes disruption of neurological functions. Factors that contribute to the incidence of road traffic accidents range from continued driving even when feeling drowsy, having a physical

condition, fewer sleeping hours, more working hours, and nutritional imbalances. Several studies during the last 20 years have suggested that sleepiness is among the main factors that cause road traffic accidents. Sleepiness while driving contributes to 3% to > 30% of all road traffic accidents globally, which may involve a variety of sleep conditions but also may be caused by sleep deprivation. More than 20% of the drivers feel a need to stop driving at least once due to sleepiness. A religious lifestyle was found to be negatively associated with the risk of road traffic accidents, as were younger drivers. This systematic review was designed for a better understanding of the relationship between sleepiness and risk of road traffic accidents.

COMPONENTS	PERCENTAGE
Computerisation of land records	86%
Mutation computerised	47%
Issuance of digitally signed RoR	28%
Cadastral Maps digitised	46%
Spatial data verified	39%
Cadastral maps linked to RoR	26%
Real time updating of Ro R and maps	15%
Number of villages where survey/re-survey work completed	9%
Area surveyed	25%

3. SYSTEM ANALYSIS

PROBLEM STATEMENT

Drowsy driving is a significant problem that can lead to road accidents and pose various challenges for individuals involved. Drowsy driving can result in severe injuries or even fatalities for both the drowsy driver and others on the road. Accidents caused by fatigue often lead to high-speed collisions and increased risk of harm. Accidents caused by drowsiness can lead to extensive property damage, including damage to vehicles, infrastructure, and other roadside elements. Repairing or replacing damaged property can be costly and time-consuming. Drowsy driving accidents may result in legal consequences for the driver at fault. This can include fines, license suspension, or even criminal charges, depending on the severity of the accident and local laws. Individuals involved in drowsy driving accidents may face challenges with their insurance coverage. Insurance premiums can increase, and coverage may be affected, leading to financial strain on the individuals involved. Being involved in a road accident, especially one caused by drowsiness, can have a lasting emotional and psychological impact on individuals. Trauma, anxiety, and stress are common consequences that may require counseling or therapy. Drowsy driving accidents contribute to the strain on emergency services, including paramedics, police, and fire departments. Responding to accidents caused by drowsiness diverts resources from other emergencies and may delay response times for those in need. High rates of drowsy driving accidents can raise concerns within local communities. Residents may become more aware of the risks and demand increased law enforcement or awareness campaigns to address the issue. One of the significant problems with drowsy driving accidents is that they are largely preventable. Education, awareness, and changes in behavior can help reduce the occurrence of accidents caused by drowsiness, making each incident particularly tragic because it could often have been avoided.

PROPOSED SYSTEM

ADAS tech, like driver drowsiness detection systems, is becoming the standard in cars today. This is a sign of the times, as technology becomes more vital to assisting drivers and increasing road safety. Some believe this technology will also lay the path to full autonomy too, which in an ideal world will make driving even safer still. When we do have fully autonomous cars, we will be able to put our worries about microsleep and drowsy drivers to one side. However, until then, losing attention at the wheel can be a deadly mistake, and one that driver drowsiness detection works to prevent. ADAS systems can analyze the steering behavior of the driver. Sudden or erratic steering inputs can indicate drowsiness. It may use cameras to monitor the vehicle's position within its lane. If the vehicle starts drifting without signaling, it could trigger a warning. In-cabin cameras can monitor the driver's face and eyes to detect signs of drowsiness. This may include drooping eyelids, yawning, or changes in facial expressions. This system may track the movement of the driver's eyes, assessing factors like blink rate and duration of eye closure. When signs of drowsiness are detected, the ADAS system can alert the driver through visual cues (e.g., warning lights on the dashboard) or auditory signals (e.g., alarms or beeps).

SYSTEM SPECIFICTAIONS

HARDWARE SPECIFICATION

To construct a system, we need materials that can be either objects or coding. The materials we need to construct the system include:

S.NO	MATERIAL	QUANTITY
1	Buzzers	1
2	Diode	2 (IN4007)
3	PCB	Req. size
4	Capacitors	1
5	Transistors	2 (BC547)
6	LED	2
7	Cables and connectors	Req.

Table 4.1: Requirements for the project

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4.PROJECT DESCRIPTION

EXISTING SYSTEM

There are safeguards in place for those whose jobs rely on long periods of driving. For example, truck drivers are forbidden from driving past 14 hours after their shift starts. But for the average driver, there are no such safe guards. It is a significant cause of accidents, with studies finding that loss of concentration is responsible for 25% of road accidents. Preventing drowsy drivers from getting behind the wheel is important. Being able to detect drowsy drivers and remind them to be safe and take a break if they're feeling sleepy is one way to address this issue. The existing system of driver drowsiness detection system has following disadvantages. Mainly, using of two cameras in the system one for monitoring the head movement and the other one for facial expressions. other disadvantage is aging of sensors and all these sensors are attached to the driver's body which may affect the driver.so to overcome all these disadvantages, we designed a system in which a live camera is used for monitoring the driver drowsiness condition and alert the driver which reduces the road accidents autonomous agency might enhance impact. The new approach offered a way to introduce new management practices, give users a say in assessing performance, remove the temptation of politicians to meddle, and reduce the need to compete for budgets with other parts of government. There were few models, however.

Having fees regulated and approved by another part of government with more electoral legitimacy helps ensure public acceptance and limits the likelihood that fees will be overly burdensome. Giving land agencies control over zoning and approval for changes in land use, for instance, risks conflicts of interest. If a land agency's financial incentives are to register as much privately owned land as possible, thereby maximizing transaction volumes, it could approve the sale of land that was rightfully public or allow private development on environmentally sensitive areas. Ethical leadership and transparency also play a role in preventing these problems, but separating policymaking and registration provides an institutional safeguard.

However, the pace of modernisation of records and bringing them to an online platform has been slow. From 2008 till September 2017, 64% of the funds released under DILRMP have been utilised.

WORKING OF PROPOSED SYSTEM

The methodology of this project is the first video is captured using a webcam and from the video first face is detected using the Haar cascade algorithm and then the eyes are detected. Then we use our deep learning model which is built using transfer learning to know the status of the eye. If it is an open eye then it will say Active and if it is a closed eye then it will check for a few seconds and then it will say the driver is drowsy and will beep an alarm.We will use Python, OpenCV, TensorFlow, and Keras to build a system that can detect the closed eyes of drivers and alert them if ever they fall asleep while driving. If driver eyes are closed, this system will immediately inform the driver. OpenCV that we are going to use now will monitor and collect the driver's images via a webcam that was attached and feed them into the deep learning model and then the model will classify the driver's eyes as 'open' or 'closed.'.

BLOCK DIAGRAM

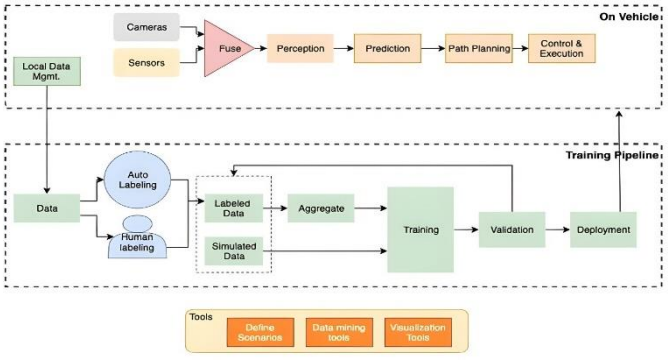

Fig 5.1: Drowsiness detection system

5.5 SOLUTION

This type of technology offers a uniquely precise and effective way to monitor driver fatigue and dramatically increases driver safety by providing notice when drowsy or distracted behaviors are detected,

allowing for the teen driver to recognize the danger and make a safe decision.

Also inside is pre-trained AI software with advanced facial recognition capabilities. The AI is what actually recognizes and audibly alerts the driver to drowsiness and distraction indicators. This thoroughly vetted AI process is as accurate as possible in monitoring a driver's status and attention. Because the system is pre-trained and pre-loaded with all of its algorithms, you don't need wifi connection to use it and go through wireless updates that take time away from being able to use the device.

5.6 RESULTS:

The proposed work is implemented on ethereum machine learning platform with solidity as a notion to code the driver drowsy - users. The work is initiated onto a personal device as an initial phase with a minimum of 4 GB memory requirement independent of the operating system. the review has highlighted the current challenges in the DDD field, discussed the practicality of each DDD system, and discussed the current trends and future directions that aim to utilize affordable, easy-to-use, and practical methods to improve accuracy and reliability.

We expect 5G networks to play a prominent role in enhancing DDD systems. With 5G connectivity, future DDD systems will be based on real driving scenarios. The data will be obtained from various drivers in actual vehicles, where factors such as ambient light, road surface vibrations, and individual differences among drivers are considered. The use of 5G connectivity will also enable the use of multi-access edge computing power for deep learning, resulting in highly accurate real-time decisions. Vehicles are expected to operate as members of Internet of vehicle networks, enabling the network to warn the drowsy driver, take control of the car (if needed), and contact neighboring vehicles in the network to alert them about the weary driver. These technologies will lead to safer roads and pave the way towards realizing smart cities.

CONCLUSION

The drowsiness detection system is capable of detecting drowsiness in quickly the system which can differentiate normal eye blink and drowsiness can prevent the driver from entering the state of sleepiness while driving. The system works well irrespective of driver wearing spectacles and under low light conditions also. During the monitoring, the system is able to decide if the eyes are closed or opened. When the eyes have been closed for too long a warning signal is issued. ultimate goal of the system is to check the drowsiness condition of the driver. Based on the eye movements of the driver, the drowsiness is detected and according o eye blink, the alarm will be generated to alert the driver and to reduce the speed of the vehicle along with the indication of parking light.

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