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Smart and Safe Headgear

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Abstract

A significant proportion of people around the globe are involved in road accidents, and the project suggests a solution to decrease such incidents. The solution is the usage of a smart helmet, which ensures the rider wears it before starting the ignition. Determining whether the rider is wearing the D-ring or not involves the utilization of male and female jack connectors. The smart helmet also can turn off the ignition key if the rider has been drinking.

In case of an accident, the smart helmet can send the current location by GPS and an emergency message to a registered mobile number using the GSM module. They can also be utilized to monitor and save driving, which can provide valuable insights into the accident scenario.

Keywords: Terms, NODEMCU, LDR sensor, Vibration sensor, alcohol sensor, GSM module, buzzer, DC motor

Introduction

Technological advancements have significantly impacted public safety, leading to notable changes in various aspects of our lives. Accidents on the road remain a global concern, causing countless fatalities and injuries every year. However, technology has offered innovative solutions to address this problem, with the development of systems such as the Alert-based system and the smart helmet. The Alert-based system is a technology-driven solution that aims to address the issue of communication during accident scenarios. The system uses a combination of sensors, algorithms, and wireless communication to detect accidents and trigger alerts immediately, providing real-time accident information to medical care centres, ambulances, and loved ones. With the ability to provide timely alerts, this system Similarly, smart headgear is an innovative piece of technology designed to promote the use of helmets and reduce the number of accidents on the road. The smart headgear developed in this project is designed to promote road safety by ensuring that riders wear helmets before starting the vehicle. It includes advanced features such as turning off the ignition key if the rider has been drinking and sending an emergency message to a registered mobile

number in the event of an accident. The success of this technology in reducing the number of road accidents and saving lives depends on its widespread adoption and effective awareness campaigns to encourage riders to use it properly. The impact of these technologies on public safety cannot be overstated.

Literature Review

Smart helmets and Designing an IOT-based smart helmet [1]: Smart Helmet systems are innovative solutions that aim to enhance safety and security in different settings, such as transportation and mining. These systems leverage emerging technologies, including IoT, to prevent and detect accidents and protect workers from hazards. For instance, in the transportation sector, intelligent motorbike helmet systems equipped with sensors, cameras, and GPS tracking help to alert riders to potential collisions with large vehicles or objects, while in the mining industry, Smart Helmet systems use sensors to monitor air quality and detect hazardous gas emissions, helping to prevent accidents and ensure worker safety. Overall, Smart Helmet systems are an effective and efficient means of leveraging technology to promote safety and security in different industries. Smart Helmet for

Accident Avoidance [2]: Smart helmet technology has been further developed with the integration of IR and gas sensors that detect helmet wearing and alcohol consumption. These sensors are capable of preventing the bike from starting if either check fails, reducing the risks associated with drunk riding and the absence of protective gear. In addition to these safety features, the smart helmet's sensors are also designed to detect the state of the bike during an accident. In the event of a crash, the sensor can immediately transmit the location of the rider and the bike to hospitals through GPS. This functionality can be critical in getting emergency responders to the scene of an accident quickly, potentially saving lives and minimizing the impact of the accident. Overall, the use of smart helmet technology can greatly improve the safety of riders, both in terms of preventing accidents and minimizing the consequences of accidents that do occur. By incorporating advanced sensor technology and GPS, smart helmets are an innovative solution that could have a significant impact on the future of motorcycle safety. 5 SMART HELMET [3]: The use of advanced technologies in helmets is a promising solution to improve safety for riders, particularly in settings such as India, where the two-wheeler accident rate is high. The intelligent/safety helmet synced with a bike module ensures helmet wearing and includes an accident avoidance detection module.

The Microcontroller-based smart helmet is a noteworthy example, using GSM and GPRS to communicate with the bike module and alert riders or emergency services in the event of an accident. Additionally, the helmet includes an alcohol detection system to prevent drunk riding, further enhancing rider safety. Overall, the integration of intelligent/safety helmets with advanced technologies can significantly improve rider safety, reduce accidents, and potentially save lives The Microcontroller-based smart helmet using GSM & GPRS [4]: The system uses an Arduino microcontroller, GSM, GPRS, and accident sensors to detect and report accidents promptly. The sensors detect impacts or collisions and trigger the microcontroller to send a text and voice message to a registered number with the accident location. It's easy to install, suitable for various settings, and can reduce response time, fatalities, and injuries caused by accidents. Overall, it's an efficient and reliable means of detecting and reporting accidents to save lives and minimize the impact of accidents.
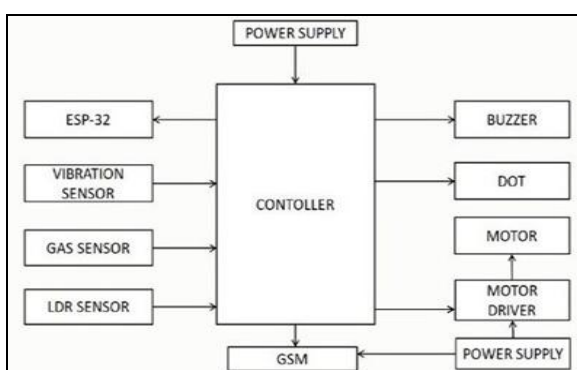

Fig 1: Types of machine learning algorithms

The five various categorization methods are utilised to predict breast cancer in this study, and their implementation in the breast cancer data set is also examined.

Results and Discussions

The use of the Node MCU microcontroller and various sensors is a significant advancement in smart helmet technology. With the incorporation of an LDR sensor and male and female jacks, the microcontroller can detect if the driver is wearing a helmet or not. If the driver is not wearing a helmet, a buzzer will sound, and the ignition key will turn off, ensuring the driver wears a helmet before continuing to ride. Similarly, if the driver is under the influence of alcohol, the buzzer will sound, and the ignition will turn off, preventing them from driving.
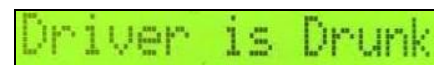

Fig 2: Smart and Safe Headgear

Fig 3: DD Monitoring System

Conclusion

In conclusion, the use of smart helmets is a promising solution to reduce road accidents and improve rider safety. With features such as alcohol detection and emergency messaging, these helmets can help prevent accidents caused by drunk driving and quickly notify.

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