



## INTELLIGENT HELM ET SYSTEM FOR PREVENTION OF ACCIDENTS AND BIKE STARTER

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### ABSTRACT

A smart helmet is an innovative solution designed to enhance the safety of two-wheeler riders. This helmet prevents the vehicle from starting if the rider is not wearing it or if the rider is under the influence of alcohol. Additionally, it features an accident detection system that alerts designated contacts via SMS, providing the location and speed of the bike at time of the accident, thanks to an integrated GPS and GSM tracking system. The helmet will incorporate sensors that transmit data wirelessly to a module connected to the bike's ignition system. The smart helmet consists of two main components: one unit on the helmet and another on the bike. The helmet module includes an alcohol sensor, speed sensor, and touch sensor, while the bike unit and helmet is facilitated by an RF 433 MHz transmitter, ensuring a seamless connection and increased safety for the rider.

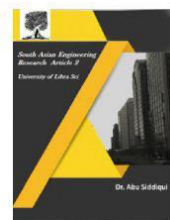
### INTRODUCTION

This project aims to provide safety for bike riders. Even since helmets have been made compulsory, still people drive without helmets. Comparatively, in the last few years, there has been a rapid hike in the number of road accidents. According to vehicle safety, India meets only two out of the seven vehicle safety standards by the World Health Organization (WHO). Two-wheelers account for 27% of total road crash deaths. Nearly 73% of motorcycle riders involved in accidents continued to wear helmets as shown in the records. Section 129 of the Motor Vehicles Act, 1988 makes it required for every single riding a two-wheeler to wear protective headgear following to standards of the BIS (Bureau of Indian Standards). In India, a drunk drive

case is a criminal offense of The Motor Vehicle act 1939, which implies the bike rider will get punished. In existence bike riders easily



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get escaped from the law. These are the three main issues that motivate us for developing this project. The first step is to check whether the helmet is worn or not. If the helmet is worn then ignition will start otherwise it will remain off till the helmet is not worn. For these, we use a touch sensor. The second step is alcohol detection. The alcohol sensor is used as a breath analyzer which checks the presence of ethanol in rider breath and if it crosses permissible range ignition cannot start. It will send the message to the registration number. MQ3 sensor is used for these. When these two conditions are satisfied then only the bike ignition will start. The third main issue is accident detection. If the rider met an accident with him he cannot receive medical help instantly, it's a big reason for deaths. There are a lot of deaths due to late medical help or the accident place is unmanned. In the rider falls for that detection, we place MPU6050 at the bike unit. Due to this mechanism, we detect the accident occurs or not. The aim of this project is to make a protection system in a helmet for the good safety of bike rider. In the helmet unit, the sensor module is built using sensors like alcohol sensors, accelerometer sensors, and touch sensors.

All the above sensors are connected to Arduino Uno and RF transmitter. Once the person wears the helmet the signals get transmitted. The unit in the bike allows the rider to start the vehicle once it receives the signals from the helmet unit. The status of the helmet worn is uploaded to the database via the ESP8266 module. All events are uploaded to the database and from the database, it is retrieved in the android application

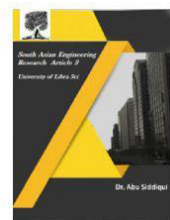
## II.LITERATURE SURVEY

**“Implementation Of Smart Helmet”  
Deekshitha K J and Pushpalatha S,  
2017.**

There was a survey till 31 Mar 2015, Which clear tells that there are total of 154.3 million two wheelers are there in India, considering only the registered and renewed vehicle in to consideration, as the density of the two wheelers increases, there the main risk factor is to provide the safety to the riders. 70% of the accidents reported are subjected to two wheelers and out 3 accidents in India 2 accidents involve two wheelers as a victims, accidents of two wheelers are because of high density roads, heavy traffic, rash or negligence driving, drunk & Drive and a Sleepy riding, many times even after the accidents, accidents



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will not be reported properly or even the medical aid or assistance will not be available to the riders because of poor or no communication of the accidents, which leads to many number of the death in the recent years. In this paper we are developing an IoT product called Smart helmet, which comprises of to units, motor unit and helmet unit, Helmet unit consists of the alcohol and Eye blink sensor, Alcohol Sensor will not allow rider to take on bike after drinking alcohol and eye blink sensor raises the alarm in sleeping conditions. Motor unit is able to communicate with the care takers with messages and GPS helps the system to track the location of the bike in case of the accidents, also this system act as accident prevention and detection system. The monitoring of physiological signals using wearable devices is increasingly becoming a prerequisite for the assessment of the state of body and mind in natural environments. This has been facilitated by small-scale analogue and digital integrated circuit technology, together with on-chip processing power for dealing with movement induced artifacts in bio potentials, which are present when performing daily activities. Physiological signals recorded in real life tend to be notoriously weak and with

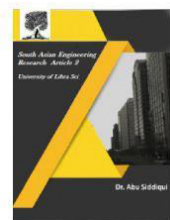
a low signal tonoise ratio (SNR). To this end, an amplifier with a high common mode rejection ratio is required; such high quality bio-appliers are typically integrated into the analogue front end of large stationary devices. Because of the many leads and electrodes required, such devices are well suited for clinical environments, where patients are normally stationary (except e.g. for cardiac stress tests), so that the noise level is relatively low.

**“Accidental Identification and Navigation System In Helmet” A.Ajay, G.Vishnu, V.Kishoreswaminathan, V.Vishwanth, K.Srinivasan and S. Jeevanantham, 2017.**

Industrial safety is one of the main aspects of industry . Working environment hazards include suffocation, gas poisoning and gas explosion. Hence air quality and hazardous event detection is very important factor in industry. In order to achieve those safety measures, the proposed system provides a wireless sensor network for monitoring real time situation of working environment from monitoring station. It provides real time monitoring of harmful gases like CO, CH<sub>4</sub> and LPG and also temperature and humidity. To overcome those hazardous situation, this system provides emergency alert to the monitoring



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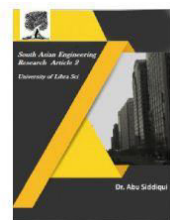


station . Some workers are not aware of safety and they did not wear helmet properly. For this purpose, a limit switch was used to successfully determine whether the workers had worn their helmet properly or not. The system uses Wi-Fi technology for transmission of data from working environment to the monitoring station. There is an alert switch at working environment for emergency purpose. The Internet of Things (IoT) is a system of interrelated computing devices, mechanical and digital machines, objects, animals or people that are provided with unique identifier and the ability to transfer data over a network without requiring human-to-human or human-to-computer interaction. The IoT allows objects to be sensed or controlled remotely across existing network infrastructure, creating opportunities for more direct integration of the physical world into computer-based systems, and resulting in improved efficiency, accuracy and economic benefit in addition to reduced human intervention. IoT has evolved from the convergence of wireless technologies, microelectromechanical systems(MEMS), microservices and the internet. The convergence has helped tear down the silo walls between operational technology and information

technology, allowing unstructured machine-generated data to be analyzed for insights that will drive improvements. In earlier days, LED helmets were deployed in Industries to inform the workers about the hazardous events. Later sensors were deployed to detect the events and the alert can be sent to the remote monitoring unit to avoid losses. Several wireless sensor network has been used to detect and transfer data. The most commonly used technology for wireless transfer is zigbee .One of the main disadvantage in using zigbee as a medium of transfer is the coverage area. The coverage area of zigbee is usually 10– 100 meters line-of-sight, depending on power output and environmental characteristics. Zigbee devices can transmit data over long distances by passing data through a mesh network of intermediate devices to reach more distant ones. The proposed system uses Wi-Fi technology to transfer data from the working environment to the remote monitoring unit. The merit in using Wi-Fi as a medium of transfer is that it covers wider area and it is the latest modern technology that has been emerging worldwide for transferring data. In this system the transferred data is collected ,stored and analyzed using Thingspeak application. Thingspeak is



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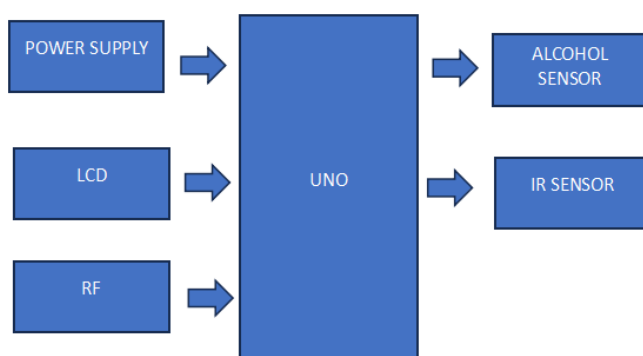


gspeak is one of the recently developed application in the field of IoT for analysing data transferred by wireless sensor networks. Mining is indispensable to the creation of goods, infrastructure and services which enhance the quality of their lives. As a society we're blessed to enjoy the many advantages that industry manufactured products provide us by processing these raw materials. Working in the earth presents many different security and health dangers. Frequently the underground environment is shaky or unpleasant. The mines that are deeper, the more dangerous it could be to be running jobs. There's oxygen leak that is restricted, and there are challenges related to leaving a mine if a crisis happen. So here we propose a mining tracking as well as safety system for the

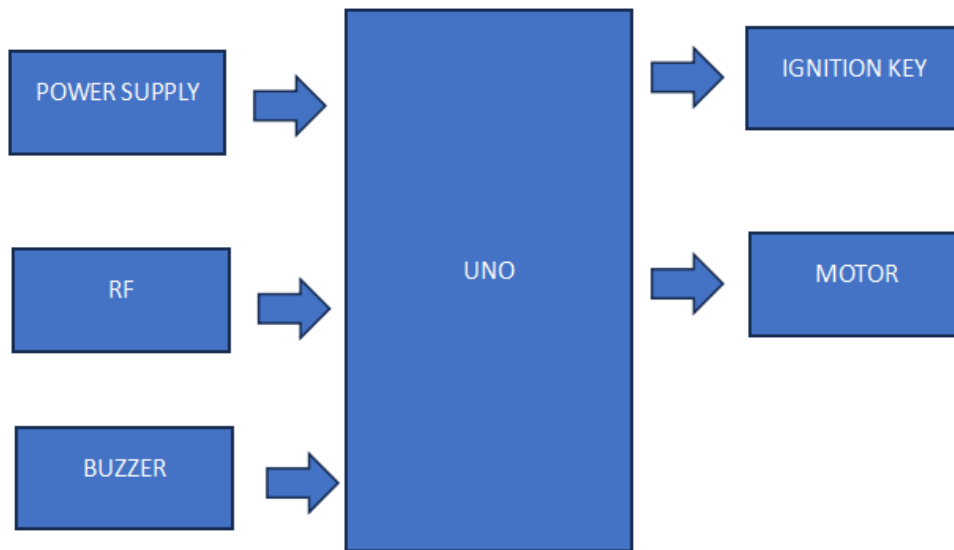
mining industry using microcontroller based circuit on the worker helmet. We use rf based circuitry to detect workers moving through the entire mining site. The helmet is integrated with an rf based tracking system which in coordination with the tracker rf systems help provide data over IOT. The system makes use of atmega microcontroller based rf tracker circuitry to receive the data transmitted by worker helmet nodes. This helps map the current location of workers through the entire mining site. Moreover each worker helmet circuit is integrated with a panic/emergency button. This button when pressed shows an emergency sign over the IOT web interface about the worker emergency. This can be used for any emergencies like – toxic gas inhalation, cave ins, physical injury etc. Thus the system ensures mining worker safety using IOT.

## Block diagram

Tx



Rx



### III. PROPOSED SYSTEM

The proposed system for the **Intelligent Helmet System for Prevention of Accidents and Bike Starter** aims to enhance rider safety by integrating smart technology into a helmet to prevent accidents and ensure responsible bike usage. The system incorporates multiple sensors and control mechanisms that are designed to only allow the bike to start if specific safety conditions are met, promoting road safety and minimizing the risk of accidents.

The system consists of the following components:

**1. Helmet with Built-in Sensors:** The helmet is equipped with a force sensor and an alcohol sensor. The force sensor ensures that the rider is wearing the helmet securely, and the alcohol sensor detects the rider's alcohol consumption level. If the rider is not wearing the helmet or if the alcohol level exceeds a predefined threshold, the system prevents the bike from starting.

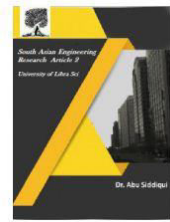
**2. Wireless Communication Module:** The helmet is connected wirelessly to the bike's ignition system. This communication link allows the helmet to transmit real-time data to the bike, ensuring the safety conditions are met before the ignition can be activated.

**3. Bike Ignition Control:** The bike's ignition system is equipped with a microcontroller that receives signals from the helmet. If both the helmet is worn and the alcohol level is below the acceptable limit, the microcontroller allows the ignition to turn on, permitting the rider to start the bike. If any condition is not met, the bike remains immobilized, preventing unsafe operation.

**4. Crash Detection and Alert System:** In addition to the starter mechanism, the helmet is equipped with an accelerometer to detect any impact or fall. In the event of an accident, the system automatically sends an emergency alert with the rider's location to a predefined contact list using a GSM module, ensuring timely assistance.



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## IV.CONCLUSION

This project aims to ensure safer journeys by reducing fatal injuries in accidents and decreasing the number of incidents caused by riding under the influence of alcohol. We have developed a smart helmet system that enables communication between the helmet and a unit installed on the vehicle. This smart helmet enhances rider safety by enforcing helmet usage and ensuring the rider is sober. In the event of an accident, it can automatically alert a designated contact, such as a parent or guardian. If any critical safety rules are disregarded, the system will prevent the rider from starting the vehicle. This project emphasizes the importance of human life by providing a low-cost safety solution specifically designed to protect two-wheeler riders.

## V.REFERENCES

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