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Smart Helmet with Rider Safety System

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EncoderanddecoderIC,RFTransmitterandReceiverSystem,MQ3Gassensor.

ABSTRACT

When a biker doesn't wear a helmet and gets into an accident at high speed, the impact may be deadly. Protecting one's brain from potentially fatal blows is as simple as donning a helmet. Malaysia is one of the nations that has passed legislation mandating motorcyclists wear protective headgear. Riding a motorbike is now safer than ever before thanks to a novel concept: a smart helmet. This is put into action by use of GSM and GPS systems. This intelligent helmet's operation is straightforward: vibration sensors, linked to a microcontroller board, are positioned in various parts of the helmet depending on the likelihood of impact.As a result, the sensors detect when the rider's helmet hits the ground and send that information to the microcontrollerboard. From there, the controller pulls GPS data from the connected GPS module. A message is automatically sent to the ambulance or family members via the GSM module when the data exceeds the minimal stress level. Also included is an alcohol detection sensor that, if activated, would cut power to the vehicle in the event that the driver is under the influence of alcohol.

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INTRODUCTION

Ensuring the safety and security of both human lives and material possessions has always been, and continues to be, a top priority. There were as many as 1.65 lakh automobiles stolen in 2013, despite the fact that law enforcement organisations boasted about how well they controlled automotive thefts. Among the states, Uttar Pradesh has the unfortunate distinction of having the most reported incidents of car theft. Worldwide, people are deeply worried about the disturbing rise in the frequency of accidents involving two-wheelers. This is because people riding these vehicles are both vulnerable and often involved in collisions with other vehicles.
coming into touch with the crashing car or obstruction during an accident leading to serious injury or death. Worldwide, vehicle accidents cause injuries to up to 140,000 people every day, with over 3,000 losing their lives and 15,000 permanently crippled. Rider carelessness, reckless driving, or operating a motor vehicle while under the influence of alcohol are the primary causes of these accidents.

1.1. Motivation

Every day, we encounter obstacles on the roadways that inspire our initiative. The number of persons killed in traffic accidents is steadily rising, and many of these victims are reckless bikers in nations like India. These days, there are a lot of fatalities caused by accidents involving two-wheelers on the road. Helmets are widely accessible, yet nobody seems to be using them. The emergency contact receives a message via GSM in the case of a traffic accident.

1.2. ProblemDefinition

Most of the casualties are a result of the most frequent carelessness, which is not wearing a helmet, and many more are a result of the wounded person not receiving the medical treatment they required in a timely manner, as the number of motorcyclists in our nation continues to rise. Biker safety and protection from traffic accidents is the primary goal of the project.

I. LITERATURE SURVEY

Achint Agarwal et. al. In prioritising the safety of both the two-wheeler and its rider, the writers have taken security into account as a crucial factor. The authors are proposing a prototype system that uses a biometrics system to increase the safety of two-wheeler systems. The integration of the aforementioned elements was the primary emphasis during the development of the bike anti-theft system. The most important feature is the two-layer anti-theft protection that has been implemented to keep the car secure from theft. Prior to granting access to the car, only authorised individuals are recorded in the database. Upon entering the vehicle, scanned fingerprints are compared with the database.

Aman Mishra et, al, Reducing accidents caused by riders' carelessness (e.g., driving under the influence of alcohol or without wearing a helmet) is a primary focus of the writers. The writers have made an effort to include an electronic method that makes it difficult to evade the most fundamental rule of not drinking while riding.

On the one hand, the authors show how the absence of deterrence has given thieves the confidence to employ devices and techniques that bypass lock and key systems; for example, they can open a vehicle in a

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matter of minutes by using a duplicate key. On the other hand, the authors highlight how riders' lack of awareness and carelessness puts them at risk of deadly accidents, from which, by some miracle, only a small percentage of victims survive.

R. Prudhvi Raj et. al. dedicated their research to identifying and resolving the factors that influence two-wheeler users' preferences about helmet use. A rise in fatalities caused by incidents involving two-wheeled vehicles was highlighted by the writers. Serious brain injuries are the primary cause. Helmets are widely accessible, yet nobody seems to be using them.

One of the primary causes was the discomfort that came from the excessive heat that was produced inside. Prototyped by the authors, it has a peltier module that operates on the thermoelectric effect and, thanks to a built-in GPS, can also monitor the vehicle's position.

Shanmuganathan J et. al. One of the primary issues in the automotive industry right now is security and the prevention of theft. Using GSM, GPS, and Android technologies, this article designs a system to prevent theft of two-wheelers. This technology allows the vehicle to be tracked and monitored. It was stated that as many as automobiles were stolen annually around the globe, despite the many technology that have been deployed to identify and monitor car thefts. The National Crime Information Centre (NCIC) reports that there were 1,192,809 recorded thefts of motor vehicles in 2006, resulting in a loss of $7.9 billion. This project's suggested security system is built to monitor and track automobiles, halt them in the event of theft, and allow for online tracking and recovery. Embedded and communication technologies from the present period are all part of this system.

Akash R et. al. Two-wheelers are now encountering several challenges. Accidents caused by inebriated riders or those who fail to wear helmets, theft of fuel or vehicles, etc. The majority of people in India prefer two-wheelers over four-wheelers, yet a 2013 study found that 1.37 lakh individuals died in road accidents, with 25% of those casualties being two-wheelers.

An improved helmet module that can track the rider's access to it is included in this article as part of the prototype. An alcohol detector and a Global Positioning mechanism (GPS) locking mechanism are also included in the prototype. Accurate information about the fuel quantity and the estimated distance that the vehicle can go with the fuel present may be obtained from the alpha-numeric fuel indicator. The proximity sensor ensures that the rider is wearing the helmet at all times, which helps to reduce the number of accidents caused by riders who fail to do so.

S. Priyadharshini et. al. This paper presents an Android-based tracking and theft prevention system that the author has developed for use in two-wheelers. The system uses GSM, GPS, and Android technology to track, monitor, and even stop stolen two-wheelers. The system works by first receiving the two-wheelers' position from the GPS module, which is then sent to the microcontroller. The microcontroller in turn sends a message to the user's smart phone through the GSM module. The two-wheelers' air and water solenoid valves are interfaced with the GPS module and GSM modem, and the system is designed to be permanently installed in the vehicle. The user can then use an Android application to stop the vehicle if it is stolen.

II. EQUPMENT-

1. **TRANSMITTER.**:TransmitterProducedRadiofrequencywithanAntennaandtransmit RF single to receiver are done at 433MHz Frequency.

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a) TransmitterCircuit

b) SolarPlate:-itconvertsolarenergyintoelectricalenergy.

c) ChargingConnector:-itisusedtochargethebattery.

d) Battery:-Batteryisusedfortostoretheenergythat usewhenbikeruninnight.

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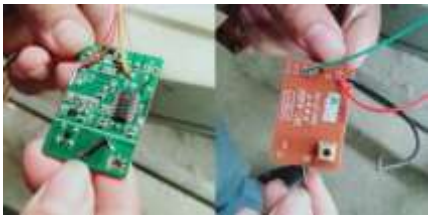
e) Push Switch.

2. RECIVER.

a) ReceiverCircuit:-



b) 5voltDCrelay:-Relayisuseasaswitchingpurpose.

c) 12voltto5voltconverter

d) PCB:-Printedcircuitboardisplacewherewesoldertheallelectricalparts.

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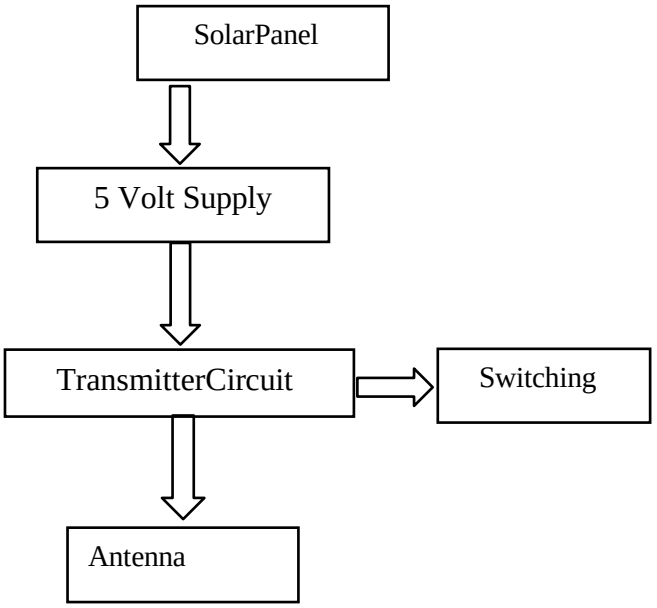
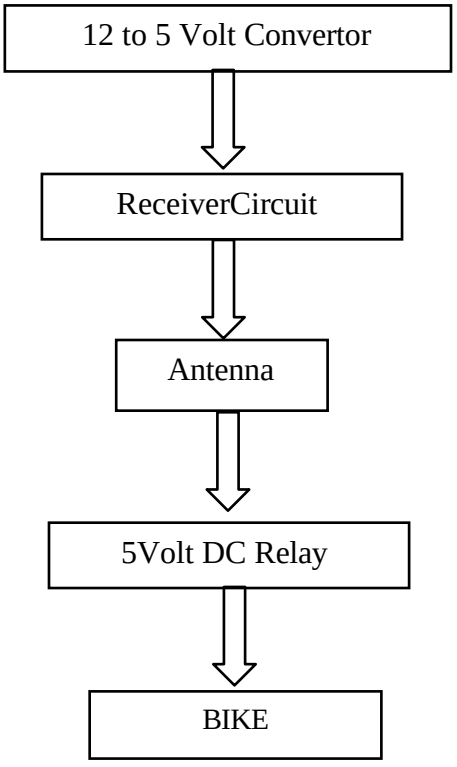
III. CONSTRUCTION



Flow Chartof Transmitter



FlowChartofReceiver

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IV. WORKING

Before starting the car, this project is aimed to verify whether the driver has worn a helmet and if they have consumed alcohol. Wearing a helmet is mandatory before a two-wheeler may be started when the rider sits on it and turns the key. When the infrared sensor senses that the rider's head is there. A high pulse will be supplied to the Encoder IC HT12E by the microcontroller in response to a signal from the sensor. The transmitter receives the encoded output and uses it to emit an RF signal at 433 MHz. The helmet contains the microprocessor, alcohol sensor, IR sensor encoder, and transmitter.

When the 5 volt battery is connected to the transmitter circuit, the system in the helmet begins to function. When we put on the helmet, we press a button, and the circuit sends an RF signal to the receiver. The motorcycle's ignition system receives a signal from the antenna, which in turn triggers the fuel injection and starts the engine when the transmitter transmits an RF signal.

V. CONCLUSION

The amount of 2 wheeler riders hurt by helmet skipping is something our smart helmet aims to reduce. Before operating the vehicle, users of this prototype will be required to put on the helmet. If the government's planned helmet programme to protect its citizens from traffic accidents were to be successfully implemented, the frequency of such incidents would drop dramatically. In addition to serving the public interest, this helmet would significantly improve the safety of two-wheeler travel.

A safer two-wheeler ride is feasible with the help of this project, which would lower the accident rate caused by drunk riding and the number of head injuries sustained in such incidents. While it's true that helmets aren't completely bulletproof, they do serve as the rider's first line of protection against potentially deadly accidents.

VI. FUTURESCOPE

So that it is affordable for everyone, the government should permit further growth of the project and provide subsidies. These helmets should be standard equipment for two-wheeler manufacturers. Protect your investment from potential theft with a security system that includes a locking code, fingerprint sensors, an alarm, and more for this helmet. This helmet may be equipped with an extra device that measures the vehicle's speed. Helmets may be adjusted by adding ventilation holes to prevent the common issue of asphyxia.

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