International Journal For Advanced Research In Science & Technology
A peer reviewed international journal
www.ijarst.in
ISSN: 2457-0362

SAFETY AND SMART HELMET SYSTEM WITH AUTO FINE GENERATION

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ABSTRACT:

The main aim of the system is to develop a smart helmet for the bikers to provide safety and security. People prefer motorcycles over car as it is much cheaper to run, easier to repair, easier to park and flexible in traffic. The rate at which number of two wheelers in India is rising is 20 times the rate at which human population is growing. In such scenario fatalities are only going to rise if things do not change fast. The risk of death is 2.5 times more among riders not wearing a helmet compared with those wearing a helmet. In order to provide safety while driving two wheelers this is being developed.

Keywords: GSM, GPS, Switch, Buzzer.

1. INTRODUCTION:

Two wheelers are widely used than other form of vehicles due to its low cost and simplicity. Most of the time rider doesn't like to wear Helmet which could result in fatal accidents. Drink and drive and rash riding are the major factors for such road accidents. Some statics shows that two wheelers cause 25% of the accidents and in that 60% of the two wheeler accidents are caused due to rash riding, drunken driving and not wearing helmet. The primary concern of all riders is safety. Nowadays, statistics says that the annual average road accident is estimated to be about 7, 00,000 of which 10% occur in India which has overtaken China. The report of a year revealed by the World Health organization (WHO) in its Global status report on road safety says that around 80,000 people are killed on Indian roads due to rash driving and less usage of helmets. Also, almost all the countries are forcing the motor riders to wear the helmet and not to use the bike when the user is riding without helmet. The system implemented by us aims at reducing the road accidents in the near future due to drunken driving. This system detects the presence of alcohol in the vehicle and immediately locks the engine of vehicle. At the same time an SMS along with the location of vehicle is send to three pre-selected contacts. Hence the system reduces the quantum of road accidents and fatalities due to drunk driving in future. This paper implemented the system on GPS for recognizing the location of vehicle of accident detection and sensors for safety measure and to know the road

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condition and reason for accidents. The helmet can attach to Zigbee, so that it can communicate the system.

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 sevenvehicle 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 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.

2. LITERATURE SURVEY

Smart Helmet with Sensors for Accident Prevention[1] The impact when a motorcyclist involves in a high speed accident without wearing a helmet is very dangerous and can cause fatality. Wearing a helmet can reduce shock from the impact and may save a life. There are many countries enforcing a regulation that requires the motorcycle’s rider to wear a helmet when riding on their motorcycle, Malaysia is an example. With this reason, this project is specially developed as to improve the safety of the motorcycle’s rider. Motorcyclist will be alarmed when the speed limit is exceeded. A Force Sensing Resistor (FSR) and BLDC Fan are used for detection of the rider’s head and detection of motorcycle’s speed respectively. A 315 MHz

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Radio Frequency Module as wireless link which able to communicate between transmitter circuit and receiver circuit. PIC16F84a is a microcontroller to control the entire component in the system. Only when the rider buckled the helmet then only the motorcycle's engine will start. A LED will flash if the motor speed exceeds 100 km/hour. Keywords-Microcontroller PIC16F844a, 315 MHz Radio Frequency Module, Force Sensing Resistance, BLDC Fan, 5VRelay, LM311 and IC 555.

Smart Helmets for Automatic Control of Headlamps [2] Intelligent Safety Helmet for Motorcyclist is a project undertaken to increase the rate of road safety among motorcyclists. There are many countries enforcing regulations to wear a helmet while riding. India is an example. The idea is obtained after knowing that the increasing number of fatal road accidents over the years is cause for concern among motorcyclists. This project is designed to introduce automatic autonomous headlight technology for the safety of motorcyclist. Here, we focus on intelligent headlamps that react according to the rider's facial movement. It makes use of accelerometer and other sensors to direct small electric motors built into the headlight casing to turn the headlights accordingly. Keywords- Smart helmets, Headlamps, Accelerometer, RF transmitter, RF receiver, Servo motor

A Smart Safety Helmet using IMU and EEG sensors for worker fatigue detection[3] It is known that head gesture and brain activity can reflect some human behaviors related to a risk of accident when using machinetools. The research presented in this paper aims at reducing the risk of injury and thus increase worker safety. Instead of using camera, this paper presents a Smart Safety Helmet (SSH) in order to track the head gestures and the brain activity of the worker to recognize anomalous behavior. Information extracted from SSH is used for computing risk of an accident (a safety level) for preventing and reducing injuries or accidents. The SSH system is an inexpensive, non-intrusive, noninvasive, and non-vision based system, which consists of an Inertial Measurement Unit (IMU) and dry EEG electrodes. Adaptec device, such as vibrotactile motor, is integrated to the helmet in order to alert the operator when computed risk level reaches a threshold. Once the risk level of accident breaks the threshold, a signal will be sent wirelessly to stop the relevant machine tool or process. Key words — Safety; Head motion recognition; IMU; EEG; accident avoidance; human machine interaction

Helmet-Mounted Smart Array Antenna [4] Introduction With the advent of wireless telecommunications, efforts to develop personnel-carried personal communications equipment are being very vigorously pursued. For the personal antenna needed in this application, the area around the skull is a prime location and the future of a head-mount antenna has been envisioned. For fire fighters, forest rangers, border patrols, and military personnel, the helmet provides a natural platform on which a head-mount antenna can be realized. However, the continually varying skeletal position associated with the movements of the individual, as well as propagation interferences including multipath fading and man-made interferences, makes it desirable to design a "smart" antenna with pattern-diversity to compensate for these problems. In this paper, we present a preliminary

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ISSN: 2457-0362

design, with measured data, for a smart helmet-mounted antenna that has these performance features.

Low-Power Low-Profile Multifunction Helmet-Mounted Smart Array Antenna[5] The development of a smart lowprofile helmet-mounted antenna with pattern diversity has been previously reported by the authors. This smart antenna array virtually ensures stable reception despite problems such as the continually varying skeletal position associated with the movements of the individual, as well as propagation interferences, even for locations which are "dead spots" for conventional antennas However, with the extremely limited space and battery power available, on the helmet, it is necessary that the antenna be multifunction and the power consumption be minimal. In this paper, we present a design for an advanced smart helmet-mounted antenna which employs low-power CMOS control devices and innovative antenna technology for reduction (patents pending). This smart array uses pattern diversity to mitigate the effects of multipath fading and the soldier changing skeletal orientation. In the past, smart antenna techniques have generally been applied to base-station antennas only. By taking advantage of a unique low-cost, low-power, pattern diversity switching mechanism, as well as the recent rapid decline in component and device costs and size, we believe we have made one of the first practical portable smart antenna systems.

3. METHODOLOGY

The flowchart describes the functionality of the "Accident Detection, Theft detection and drive protection using intelligent wireless safety helmet". The helmet unit conditionally checks "Helmet Wearing" and "Alcohol Sensing". If condition is met then helmet unit sends affirmative signal to bike unit through RF communication [8] .There after the vehicle start moving. When accident take place then GSM module sends location using GPS to saved contact list.

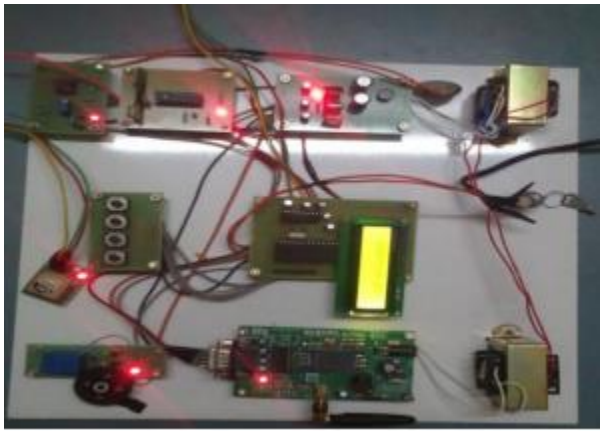

Fig.1. Hardware kit

Illegal consumption of alcohol during driving is 0.08 mg/L as per the government act but for demonstration purpose, it is programmed to the threshold limit 0.04 mg/L .threshold can be adjusted using potentiometer. If sensitivity of MQ-3 is more 0.04 mg/L of alcohol in breath then the helmet unit will communicate with vehicle unit and show" Driver is drunken" thereafter the ignition system get switched off as shown in figure.

Arrange of frequency generated depending upon the vibration produced due to accident or obstacle .if the frequency is greater than the threshold

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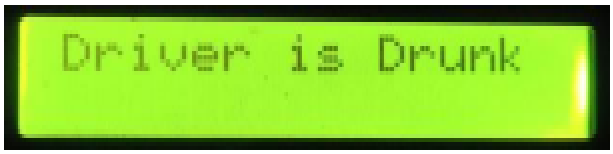
ISSN: 2457-0362

value then vehicle unit shows “Bike has fallen “as shown in figure.



CONCLUSION

The developed system efficiently ensures. Rider is wearing helmet throughout the rider. Rider should not be under influence of alcohol, Accident detection &theft protection. By implementing this system a safe two wheeler journey is possible which would decrease the head injuries during accidents and also reduce the accident rate due to driving bike after consuming alcohol. A helmet is not be 100% foolproof but it definitely the first line of defence for the rider in case of an accident to prevent fatal brain injuries. The proposed approach makes it mandatory for the ruder to use this protective guard in order to drive a two wheeler vehicle and ensures the safety of human brain and therefore reduces the risk of brain injuries and deaths in case of an accidents. Besides the developed system prevents the theft of two wheeler.

Future Scope:

The developed system efficiently ensures that the rider is wearing helmet through out the ride. Rider will not be under the influence of alcohol while riding. Accident location can be detected, which is helpful to provide immediate medical help. Vehicle theft can be detected and by sending lock message the ignition can be turned off. In this project belt tie sensor is used instead pressure sensors can be used to detect if the helmet is worn, IR sensors and temperature sensors can also be used for a better detection. we can make use of small camera for the recording the drivers activity. If there is a large demand of this type of helmets we can manufacture whole circuit in printed circuit board, so that circuit becomes smaller and can be easily fitted into helmet. In this project RF transmitter and receiver are used to provide a proper communication. In future we can enhance our project through placing high efficiency RF transmitter.

REFERANCES

1. Amitava das and SoumitraGoswami [2015],”Design And Implementation of Intelligent Helmet to Prevent Bike Accident In India".

2. E.D.Dekiaris, A.Spadoni and S.I.Nikolaou,May 2009,"New safety and comfort in powered two wheelers".

3. Harish Chandra Mohandas, Raja Kumar Mahapatra and Jyotirmayee Module (2014)”, Anti-Theft Mechanism System with Accidental Avoidance and Cabin Safety System for Automobiles”, International Refereed Journal of Engineering and Science (IRJES), Vol. 3, No. 4.

4. M.Pieve,F.Tesauri and A.Spadoni,May 2009,"Mitigation accident risk in powered two wheelers:Improving effectiveness of human machine interface collision avoidance system in two wheelers"

5. Orace, V.S.Reinhardt and S.A Vanghn, “Integrated disease Surveillance Project –Project Implementation plan”, 2004.

6. Ping Li, RamyMeziane, Martin J.-D. Otis, Hassan Ezzaidi, September 2015” A Smart Safety

Helmet using IMU and EEG sensors for worker fatigue detection" REPARTI Center, University of Quebec at Chicoutimi Chicoutimi, Canada Email: Martin_Otis@uqac.ca Philippe Cardou REPARTI Center, Laval University Quebec, Canada

7. Prof.PratikshaBhuta,KaranDesai,ArchitaKeni, "Alcohol Detection and vehicle controlling",International journal of Engineering Trends and application, 2015.

8. Prof.Sudarsan .K and Kumaraguru . P (2014), "Helmet for Road Hazard Warning with Wireless Bike Authentication and Traffic Adaptive Mp3 Playback", International Journal of Science and Research (IJSR), Vol. 3, No. 3, ISSN.

9. Prof.Sudarshanraju,Manjesh, January 2015 "Two Wheelers By Smart Helmet And Four Wheelers by Vehicular Communication", International Journal Of Engineering Research, Hindupur.

10. Vijay J, Saritha B, PriyadharshiniB, Deepeka S and Laxmi R (2011), "Drunken Drive Protection System", International Journal of Scientific & Engineering Research, Vol. 2, No. 12, ISSN: 2229-5518.