Intelligent Smart Helmet System: A Review

Anjali Baburaj[1], Thasni V.T[2], Reshma N.S[3], Yadhu Krishnan P[4], Deepak K.N[5]

Student, Computer Science and Engineering, Universal Engineering College, Thrissur, India[1,2,3,4]

Assistant Professor, Computer Science and Engineering, Universal Engineering College, Thrissur, India[5]

Abstract: Some of the research papers related to smart helmet with driver behaviour analysis to be analyzed in this review paper. In the new era smart helmet is a special idea which makes motor cycle driving safer than before. By studying all these papers, we get an idea that all the systems contain basic features like auto ignition with the help of helmet wearing status, alcohol content and accident detection. While reviewing these papers, we get more ideas about smart helmet, how to implement different sensors to sense different features and how to use the sensors within the helmet in proper manner. Some of these papers are using the same sensors like alcohol sensors, speed sensors and slight difference in the implementation only. The motive of this system is to ensure all the motorcycle riders should compulsorily wear helmet and obey traffic rule. Through this paper, the most remarkable studies of the last 6 years were studied thoroughly. It has a great feature of detecting accidents and inform to emergency contacts of the driver via SMS with location and speed of the bike before the accident occurs using GPS and GSM.

Keywords: Accelerometer, Alcohol sensor, GPS, GSM, SMS, Speed sensors

I. INTRODUCTION

In the last decade, the number of improvements in smart helmet has been more than ever yet a significant number of serious road accidents after still occur all over the world. The Main reason for road accidents are caused by human mistakes, violating traffic rules, usage of mobile phone, eating and drinking while driving. This may lead to severe head injury and death. Previous study indicates that 25%-30% of accidents are related to the violation of traffic rules. More than 70% of riders drive without wearing helmet without any specific reason. According to the report provided by the Indian government, in every hour 55 accidents occur and 70% lost their life on road due to accidents.480652 accidents happen alone in 2016.Approximately 60000 traffic accidents take place due to sleepiness problems. The accident also happened because of speeding, drunk driving and lack of experience or focus. 61% of road accidents are caused by over speeding. The age group between 18-45 has a major share (68%) in the number of road accidents.

In most of the countries, motor riders are forced to wear the helmet and not to over speed the vehicle but the riders are still violating the rules. To overcome this issue, researchers worked by using the methods like auto ignition that motor did not start until the rider wear the helmet on his head. Many sensors are also been used to avoid accidents. Some other methods are also looked into, record the speed data, limit the over speeding, the medical services can be provided for injured people when an accident occurs using GSM, tracking the vehicle location using GPS.

All these references used in this paper are contributed to the development the project.

II. METHODOLOGY

The smart helmet system mainly consists of 2 modules; helmet module and the bike module. Helmet contains switches which are connected with a microcontroller unit. Sensors like alcohol sensor, speed sensor and an RFID tag are placed on the helmet. The bike module consists of an accelerometer, RF decoder microcontroller unit, relay, GPS module and an IOT system.

A. Helmet unit: Two switches are placed on the helmet. One of the switch is placed on the centre of the inner surface of the helmet and next one is placed on the helmet buckle. It checks the position of the helmet continuously and send the helmet status to the microcontroller and then to the RF transmitter. The switches turned ON only when the rider wearing the helmet on his head properly. Thus the proper placement of the helmet ensured by these two switches. The alcohol sensor used in this section senses the alcohol content of the rider's breath. The speed sensor of the bike is recorded by using a Hall Effect sensor. The comparator checks the data stored by the alcohol sensor and the speed sensor and given it to the RF encoder. If the rider has an alcoholic breath, then the bike ignition starts otherwise engine remains OFF.

B. Bike unit: The main task of this section is to receive the helmet position data by the bike unit through a RF receiver and send data to the microcontroller on the bike unit. When the transmitted signal from helmet unit is received by the bike unit, then the vehicle ignition system will be turned ON. If an accident occurs, then the tilt angle of the vehicle is

measured by using an accelerometer. The GPS module placed in the bike detect the vehicle location. The accident status is send to predefined persons using GSM. All these sensors and parameters are controlled by using microcontroller and thus log in to the server. A WIFI module is presented in the bike which is used for the internet connection and for sensing all these data through MCU. For log in process, http protocol is used. Raspberry pi3 module is also used in this section. An authorized person can access the data from anywhere at any time in the world through internet which helps the tracking of the helmet and rider status. All the data sensed by MCU can accessed by the traffic authorities and thus they can categorized and rate the riders using their driving status by using an application. Python language is used for build the application. Thus the traffic authority can warn or monitor the riders by using the rider statuses.

C. Modes of communication
A. GSM
B. VANET
C. WIFI
D. BLUETOOTH
E. RFID
F. ZIGBEE

GSM (Global System for Mobile communication): GSM is global system for mobile communication which is widely used for communicate through mobile. GSM uses TDMA (Time Division Multiple Access), GSM and CDMA (Code Division Multiple Access).GSM compress the data and digitized. Then the data send through a channel with other streams. The channel mainly uses two streams of user data and each have a time slot itself. The GSM operates at the frequency band of 900 MHz or 1800 MHz . The GSM has 4 parts and each parts work together with a function.
1. Base station subsystem (BSS)
2. Network switching subsystem (NSS)
3. The operation and support subsystem (OSS)
4. The mobile itself

VANET: VANET is Vehicular Ad-hoc Network which is used for Vehicle to vehicle communication with different purposes. It is networking of vehicles which moving at high speed. The main purpose is that it improves the road security. The VANET introduced by using the principles of MANET (Mobile Ad-hoc Network). MANET is a wireless network used for exchanging the data to the domain of vehicles. VANET is also used for inter vehicular communication (IVC). Sensors are fitted in the vehicle. The sensors used in the vehicle interact with the sensors of other vehicle or interact with infrastructure. In order to communicate between the vehicles, the vehicle in the ground forms an Ad-hoc network.

WIFI (Wireless Fidelity)
WIFI provides network connectivity by using radio waves. A wireless adapter is used establish a connection to create hotspots and the wireless router. It is a world popular wireless networking technology uses radio wave to provide high speed internet and network connection and based on IEEE 802.11.

Bluetooth: It is a wireless communication which can be used for transmitting the data between two devices. It is Personal Area Network (PAN) which has a frequency of 2.45 GHz. Its physically range typically less than 10 m (33 ft). Bluetooth can be used in personal computers, smart phone, gaming consoles, audio devices.

RFID: RFID is Radio Frequency Identification Technology is used for monitoring and identifies the objects individually. RFID can monitor the object during moving stage. RFID technology mainly used instead of bar-coding system. Using RFID technology we can easily identify the object. RFID consist of 2 components.
1. RFID tag: Tag consists of a chip and an antenna. Chip holds the information about the object and antenna provides the communication between the receiver.
2. RFID reader: It reads the RFID tag details using RFID antenna which is built inside the RFID tag.

ZIGBEE: ZIGBEE is a wireless network used to create a personal area network (PAN). It is a low power network mainly used for home automation, traffic management and small projects with low power and low data rate. The physical range of ZIGBEE is 10-20 meters. It is simpler and less expensive network. ZIGBEE is like Bluetooth device. It can transmit data in long distance using mesh network.

A. Sensors
I.   Alcohol sensor
II.   Hall effect sensor
III.   Accelerometer
IV.   Light Dependent Resistor

V.   Mobile sensor
VI.   Force Sensing Resistor
VII.   Vibration sensor
VIII.   Bioelectric sensor
IX.   Gravity sensor
X.   Temperature sensor
XI.   Pressure sensor
XII.   IR sensor

Alcohol Sensor: Alcohol sensor detects the presents of alcohol in breath. This sensor can activate at a temperature ranges from 10 to 50 degree. Power supply will be less than 150 mv to 5v. This sensor is mainly used for traffic police now days. MQ-6 is one of the famous types of alcohol sensor which is suitable for breath analyzer. It is used to checking the concentration of alcohol in a sample and mainly used by traffic police.

Hall Effect sensor: Hall Effect sensor is used to measure the magnitude of a magnetic field. Output voltage is directly proportional to the magnetic field. This sensors are used for proximity sensing, Positioning, Speed detection and current sensing application.

Accelerometer: Acceleration forces are measured by using   the accelerometer. It is used by many mobile devices sense movement or vibrations. It measure the change in speed or velocity divided by time. By using accelerometer, the user can be determined whether an object is move to uphill or whether fall over, or if tit tilts, its fly horizontally or downward.

Force Sensing Resistor: They are also called force sensitive resistor and sometimes called FSR. It is a material used for change the resistance when a force, mechanical stress or pressure applied.

Vibration sensor: Vibration sensor is also known as piezoelectric sensors which are flexible devices and it is used for measuring purposes. These sensors measure the changes with acceleration, temperature, force, pressure or strain by changes to electrical charge. This sensor measures quantity and capacitance for deciding fragrances of air.

Bioelectric sensor: This sensor is used for monitor the body bioelectric data and it comprise of finger like parallel projections substantially. It forms dielectric substrate.

Gravity sensor: The gravity sensor is used to measuring the effect of acceleration in earth's gravity. It is derived from accelerometer. If a device having gravity sensor held up, the gravity pull of earth is same as the gravity acceleration source. The tilt angle of the can be calculated by using this sensor. Small body tilts were ancient gravity sensors and id tether to a wire connected to any device.

Temperature sensor: It is a device, usually a resistance temperature detector. The temperature data of a particular source are collected and thus covert it into understandable for an observer or a device. Temperature sensors having the applications like medical devices, HV and AC system environmental controls, and chemical handling and automotive under the hood monitoring and controlling systems. Thermometer is the most commonly used temperature sensor and is used for measuring the temperature of solids, liquids and gases.

Pressure sensor: Pressure sensor is used for the pressure measurement of liquids or gases. It is stated in terms of force per unit area and is the force required to stopping a fluid from expanding. It acts as a transducer and generate signal, is electrical. It indirectly measures the variables such as speed, altitude, gas or fluid flow and water level. Pressure sensors are also known as pressure indicators, manometers, pressure transducers, pressure senders, piezometers and pressure transmitters. It can vary drastically in performance, design, and technology, cost and application suitability. For capturing high speed changes in pressure, different types of pressure sensors are designed.

IR sensor: It is an electronic device and it detects and measuring the infrared radiation of the surrounding environment. William Herschel discovered this sensor in 1800 and he noticed that while measuring the temperature of every colour of light which is separated by a prism, the temperature beyond the red light was highest. The wavelength of the IR is longer than that of visible light. It is invisible to human eye. Infrared radiation can be given off by anything that emit heat.

III. LITERATURE SURVEY

In this paper [1] the intelligent bike system checks whether the rider is wearing the helmet. It also checks the non-alcoholic breath while diving. There we have a RF transmitter at the helmet and RF receiver at the bike. To ensuring the wearing of helmet by the rider, a switch is used. The proper placing of the helmet is ensured by the ON condition of the switch provided in the helmet. To detect the presence of alcohol, an alcohol sensor is placed near to the mouth of

the rider in the helmet. RF encoder is used to code the data to be transmitted to digital signal and transmitted through the RF module. If any of the two conditions is violated, then the engine will be OFF. Microcontroller is used to control the relay function used in the bike module and also control the engine through the relay interfacing unit. The main advantage of these systems is the alcohol detection; thus the rider obeys the traffic rules. It checks the helmet status and makes the helmet compulsory for the rider, therefore safe two wheeler journey is possible and reduce the accidents.

[2]In the work design a system for online driving style recognition. Matlab / Simulink is used for implementation. Fuzzy logic is used to identify Current driving style. Use a signal from navigation system known as road class. There are two methods used in fuzzy logic system that are fuzzification and defuzzification, these concepts are used in the work.

[3] In this paper wide researches view of vehicular ad-hoc network (VANET) technology. And also provide a view of MANET concept. While using VANET high speed internet access to car. VOIP services and Google talk or Skype is also be provided in VANET. Security of network is a big issue while using this technology.

[4]In this smart helmet consist of GSM &GPS technology for accident detection. We know that day by day the accident rate is increased and death rate is increased because of lack of medical service at proper time. The helmet contains a vibrator sensor, when the helmet is hit the ground; it will sense the value and compare to the threshold value. If the sensed value is higher than the threshold value, then the system detects the accident. This data controlled by microcontroller. Then collect the location of rider from GPS module and send a message to the relatives and ambulance automatically using GSM Module.

[5] This paper introduces a low power helmet that provides safety for two-wheeler rider. The main goal of this paper is Helmet is mandatory for rider to start the bike. It is a way to stop starting of vehicles without wearing helmet or even if the driver is boozed. An alcohol sensor and sensitive switches are placed inside the helmet to detect the alcohol content and helmet status, and this helmet is connected wirelessly to the motorbike. The wireless connection is established by RF module. Lithium ion battery and solar panel is used for charging the helmet circuits. This is a compact, fast and feasible Helmet system.

[6] This paper introduces a smart helmet with different features. This helmet contains two modules. First one is helmet module and another one is bike module. The wireless communication is provided by RF module. The main goal of this system is ensure the rider is boozed and wearing the helmet. Helmet module contain alcohol sensor, Fog sensor. Fog sensor used for increase the visibility in the case of smog. Helmet contain RF transmitter to collect the data and send to the RF receiver in the bike unit. RF receiver sends the data to the microcontroller and processed. If accident occur message is automatically send to the authority and relatives for getting proper medical service. Next feature is E-HELMET, is used to pay the money to the toll or other situation without stop the bike.

[7] In this paper, based on driving status we are analyzing the driver behavior and assist in driving task. Categories the task in to safe driving task and dangerous and distracting tasks. Kinect is used to collect the driver behavior signals. Here the different tasks are identified using feed forward neural network (FFNN).used in real time monitoring study, system is benefit for future ADAS design.

[8]The paper introduces an auto ignition system and a theft security system. TO make the transmission between the transmitter and the receiver, a Bluetooth wireless communication module is used. The engine will be remains OFF, if the driver should not wear the helmet. The engine will be ON automatically, when the rider wears the helmet. In the sensor, the Bluetooth wireless communication module connected to the bike receives the information. Two modules are there: One is the helmet and other is the bike. To communicate the bike with helmet, encoder, wireless data receiver and a transmitter are used. AT mega controller is used as a CPU in both the helmet and bike modules. The aim of this project is to protect the life of the rider and thus reduce the death rate at road accidents by push the rider to wear the helmet using auto ignition system.

[9] In this system, flex sensor is used to detect whether the rider wearing the helmet or not. The alcoholic content is detected by using an alcohol sensor senses the rider's breathe. If there is any alcohol content present, the bike did not start. The bike will start only if the rider wears the helmet and there is no alcohol content in the rider breath. An accelerometer is used to detect the motion and tilts of the helmet when the rider crashes or helmet hits on the ground and reports the accident. The information of corresponding location can be send to the emergency contact number or family members of the driver. GSM in the helmet is used to transmit the accident information to predefined numbers. All the sensors and modules used in the system are controlled by ARDUINO UNO.

[10]The system mainly has two modules. One is the helmet module and other is the bike module. Switches are provided in the helmet that pass signal to RF transmitter through microcontroller unit. These switches ensure the wearing of helmet in proper place. If the helmet wears, the switches turned ON and then ignition system of the vehicles starts. After ignition starts, the system records the data of the rider while riding. The data includes speed, accident and helmet status and location of the vehicle. Such data are send to the nearby medical hospitals, traffic authority and parents of the rider. Only the authorised persons can access data by log in to the server. Microcontroller control all the sensors and modules. Http protocol is used to transmit data from the MCU and logged on to server and the library files are implemented using python language. The authorised persons from anywhere can access the data of the rider or keep track of the vehicle and driver status.

[11] The main motive of the project is accident detection, notification and prevention. The system uses WIFI based raspberry pi3 controller which is the networking system. The cloud based services are used to interface Bluetooth and raspberry pi. The receiver contacts are recorded in the database and will send messages to the receiver. Various sensors like pressure sensor, voice sensor, speed limit sensor, vibrate sensor are used and these are controlled by raspberry pi3. When an accident occurs, then the data recorded by the GPS is send to ambulance or family by GSM. Speed limiter sensor detects speed of the rider. Of the speed exceeds 120 km per hr, then the bike will stop automatically. Mobile sensor prevents the rider from using the mobile phones while driving. If the rider uses the mobile phones, then bike stops. Traffic light sensor makes the rider to obey traffic rules.

[12] Smart helmet is mainly used for safety of driver and theft detection. The mandatory feature is to wear helmet without alcohol content for start the bike. If the driver is alcoholic, then the bike will not start. Smart helmet provides accident detection feature to protect the rider from accident. When accident occur the system inform the concerned authority with location status using Global Positioning System (GPS). So the rider gets medical service at proper time. The helmet consists of Alcohol sensor and Helmet detection key. The bike system consists of a microcontroller, vibration sensor, GPS, GSM, LCD and Relay. If the biker doesn't wear the helmet, then the LCD will display a warning message to wear the helmet. And also display the alcohol and accident warning. These devices are controlled by microcontroller. The bike and helmet system are two modules, the connection between these two modules are provided by RF module.

[13] This paper is a survey paper. This paper shows different kinds of devices used to develop the smart helmet. Methodology is different in all papers related to smart helmet. Commonly used sensors are FSR sensor, Alcohol sensor, Vibration sensor and LED, ARDUINO, ZIGBEE and PIC microcontrollers are mainly used in smart helmet. GSM and GPS module are used for detecting the accident and message passing. Some paper includes bioelectric sensors for check the brain activity. Smart helmet is an innovative idea to protect the motorcycle driver.

[14] In this paper we are analyzing driving behavior. This approach is a combination of auto encoder and self-organized maps (AESOM) used to extract features and to classify the behavior of driving. GPS is used to collect observations. Abnormal driving is to be detected using AESOM framework. Crash and near-crash event are to be predicted and addressed. AESOM is a fairly interpretable. In this paper we developed a hybrid unsupervised deep learning model to study the driving behavior and risk patterns. This approach is a combination of auto encoder and self-organized maps (AESOM) which is used to extract latent features and to classify driving behavior. The data are to be collected using global positioning system (GPS). According to the study of world health organization (WHO) in 2016 approximately 1.25 million number of road fatalities. Lots of effort needed to analysis the driving behavior and the classification of driver's risk pattern. The studies on road safety have an important focus on investigating factors associated with fatal and serious injuries. Traditionally the data are collected via travel surveys, naturalistic driving style. In this paper we studying vehicle movements including speed change, acceleration/deceleration, turning from GPS sensor data in a short and regular interval. The aims of this system are to develop an effective approach that can extract the low-dimensional features of driving behavior and explore the hidden behavior sub group across a heterogeneous population. In the new era deep learning has been advance in the new statistical and computational paradigm. The approach has two model components. The main advantage of GPS sensor is unobtrusive data collection and large scale of sample, real time and continuous dataset. GPS sensor has problems like high level of noise.

[15] In this paper several strategies are used for model and improve driving monitoring and assistance system (DMAS). DMAS framework will be reviewed in this work. Driving style, fatigue, driver's distractions are analyzed. Reduce driver in attention and source distractions.

[16] In India most widely used vehicle is motorcycle. In India road accident rate are very high. Most of the accidents are due to peoples still avoiding the use of helmet. This system used to create awareness in the society by the use of helmet and make the riders safe .It is implemented using RF communication. In the system there will be a transmitter module and a receiver module. The transmitter module is fixed in the helmet and the receiver module is placed on the bike unit. It is protected using a tool kit enclosure. There will be two modes of operations; Normal mode and Service mode. The input of normal mode are the activation signal (swtx) and the passkey activated using setting mode (modesw).which is a default mode. In the service mode is activated by toggling a mode switch to high.

[17] The purpose of this helmet is to detecting and reporting accidents. This system using different kind of sensors Wi-Fi enable processors and cloud computing infrastructures. Accelerometer value is used for accident detection. When an accident happens the related information about the driver will be sent to emergency contacts used cloud based service. Global positioning system is used for obtaining the vehicle location. Konnect is the prototype of the smart helmet. Driver head movements and the helmet position are monitored using 3-axis accelerometer which will help to calculate the possibility of accident. When accident occurs the threshold limit will increase and text message will be send to the emergency contacts.

[18] This project undertaken an intelligent safety helmet for motorcyclist helps to increase the rate of road safety among motorcyclists. Most of the countries like India enforcing regulations to wear helmet while riding. Numbers of accidents are increasing day by day. In this has a feature like automatic autonomous headlight technology for the safety of the riders. According to the facial movement the intelligent headlamps will reacted. Use different kind of sensors like accelerometer. It contain an Atmega 328 chip by using this all code is done. Which is present on the Arduino

board. At the top of the helmet there will be a 3-axis accelerometer is attached. According to the head directions change on the three axis(X, Y, Z) values are to be passed to the device. The RF transmitter helps to establish a wireless communication between the helmet and the headlamp. The accelerometer in the helmet unit measures the acceleration on the 3 axis of accelerometer and returns a voltage between 0 to 5volt.this is an analog voltage read by the read pins of ARDUINO board. This analog values are converted in to a digital by using an ADC present in the microcontroller. There are two servo motors which is inside the head lamp helps to move up, down, left and right. This motor rotate 0-180 degree. Li-pp battery (Lithium polymer battery) is used in head lamp. Which used to power up ARDUINO, RF receiver, led lamp and the two servo motor.

[19] The number of tow wheelers in India are increased to a great extent. And which will leads to numerous accident thereby causing death of the rider. In this system has 4 different modules. Which are accident identification and alert module, navigation system, voice call service through Bluetooth and a solar panel for power source. Arduino board is interfacing with GSM module, which is used to send an alert. This alert message is sent to ambulance and guardians.
In navigation module the helmet is interfaced with mobile, the data are to be collected. Which helps the rider to route to the destination.

[20] In vehicle there are many electronic control units (ECU)
And sensors. The information collect from the sensors are sent via control area network (CAN) of the vehicle. Deter mine the vehicle parameter and vehicle conditions. Control Area Network is used to exchange data. Was introduced in 1983 by Robert Bosch. Engine control unit, Electric power steering unit, Powertrain control module and Brake control module are the basic ECU's in vehicle. Which has a speed up to 1Mbps. ECUs communicated through CAN messages. CAN is connected to the Arduino UNO using SPI connection. And the ARDUINO is connected to the Teensy 3.6 using UART connections. This system mainly focuses on driver assistance and behavior analysis, vehicle condition analysis which aiming to make the vehicle efficient and improve road safety.

[21]Various driving style solution are investigating in this paper. Machine learning and artificial intelligence algorithm is used to analysis current driving behavior and driving style analysis. The aim to identify and the evaluate the possibilities for unique driver identification contain the concept of fuzzy logic inference system ,hidden markov model and support vector machine in the past decade driver behavior studies over driver behavior questionnaire s(DBQ).which is used as measure of driver behavior. Advanced. Driving assistance system (ADAS) which has features like lane keeping assistance system, forward collision warning system and breaking system which are to be introduced in the paper.

[22]The main focus of the system is to avoid drunk driving. Hence the bike will not start while the driver is drunk. Two wheeler accidents leads to the death and severe head injuries .now a days in India peoples are not wearing helmet so introduce a new system called smart helmet. Smart helmet is implemented using Arduino Uno development kit. Which consist of RF transmitter and RF Receiver system .the bike will not start while the driver is not wearing the helmet in a proper manner. Inside the helmet there will be an alcohol sensor which is placed near to the mouth which is used to identify the alcohol breath .if the tow conditions are satisfied the bike will start. Here we use a LDR sensor which is used to ON and OFF the headlight automatically. Within the helmet there will be a vibration sensor .which is placed in different places inside the helmet and using this sensor detect any crashes send helmet hit the ground also. GSM and GPS are also used.

[23]This system which is integrated with the smart helmet and intelligent bike. Which is used to reduce the probability of two wheeler accident rates and drunk drive cases. The flex sensor is used to detect that the person is wearing the helmet or not .alcohol sensor detect the presence of alcohol. For starting the bike there will be two condition to be satisfied by the rider that the driver should wear helmet in a proper manner and the driver will not drunk. The bike status will remains OFF .there are various technologies available for the safety of drivers .there will be wireless communication provided between the bike and the helmet unit. If any person met with an accident no one will help the person they simply leaving or ignore the person. This will leads to the death of that person.to avoid this we provide feature to send messages to emergency contacts of that person. Using GSM and GPS system.

[24]This system will reduce the death rate in road accident. Here helmet and bike is connect through Bluetooth. The current location of the rider is analyzed using GPS
Module. GPS fixed inside the helmet if any accident occurs then it will be sense using sensors then the signal will send to the micro controller. Micro controller will sent the signal to corresponding GSM and GPS modules. Which will sent the alert messages along with the location and speed of the bike. Latitude and longitude along with exact position is collected using Google maps. In this system we use two modules the RF transmitter and the RF receiver. The transmitter is placed in the helmet unit and which send signal to the micro controller .the receiver is placed in the bike unit.

[25]The proposed system introduces an intelligent helmet system which helps to detect the mobile phone usage while riding, alcohol consumption. They also insist very bikers compulsorily wear the helmet. The existing system is for alcohol detection and when an accident occurs the accident status will send to the parents via SMS using GSM. The engine will not start if the rider is drunk. There is a auto ignition system in this propose method which make sure that the rider wear the helmet or not and also detect the presence of alcohol content. The bike get jammed if the rider using the mobile phones while driving. The head light of the bike get dimmed automatically if a vehicle comes across the

bike which using this system. The alcohol sensor is used for the alcohol detection function. There is a receiver and transmitter used to pass the signals to the bike unit.

[26]There is an inbuilt Bluetooth module on this proposed system so that when the rider gets a call, he can attend or continue the call without removing the helmet from his head. Other feature used in this system is auto ignition which means the bike will not get started until the rider wears the helmet otherwise the bike remains OFF. There is a implementation of RF receiver and RF transmitter which is used for he communication between the bike and the helmet. In this system, vibration sensor is used for the accident detection. And an ignition controlled unit is also used. It has a block diagram for both helmet and bike system. They mainly discussed for developing a solar smart helmet with multi features. Like charging the mobile phone, inbuilt Bluetooth, cooling fan. These functions are helped for making the driving more comfort and control the ignition, accident detection are for the safe driving.

IV.CONCLUSION

By reviewing all the papers, we came to know and conclude that the smart helmet system should be very effective and essential for providing safety for the biker. By using the sensors like alcohol sensor, flex sensor, accelerometer, temperature sensor, pressure sensor, IR sensor, gravity sensor, bioelectric sensor, LDR, Speed sensor, force sensing resistor, the smart helmet provide a better security to the rider. The sensors are used along with the microcontrollers such as ZIGBEE, Arduino, PIC microcontroller and also uses the technologies like GSM and GPS in the intelligent smart helmet system. This idea will contribute more secure and safe developing India. Just take one step forward by the society that is wearing the smart helmet while driving the bike.

ACKNOWLEDGMENT

REFERENCES

[1]. Sudharsana Vijayan, Vineed T Govind, Merin Mathews, SimnaSurendran, Muhammed Sabah,"ALCOHOL DETECTION USING SMART HELMET SYSTEM",- International Journal of Emerging Technology in Computer Science & Electronics (IJETCSE) ISSN: 0976-1353 volume 8 issue 1 –APRIL 2014.

[2]. Dominik Dorr ¨ 1 , David Grabengiesser2 and Frank Gauterin1 2014,"Online Driving Style Recognition using Fuzzy Logic"- IEEE 17th International Conference on Intelligent Transportation Systems (ITSC) October 8-11, 2014. Qingdao, China.

[3]. Elias C. Eze, Sijing Zhang and Enjie Liu, "Vehicular Ad Hoc Networks (VANETs): Current State, Challenges, Potentials and Way Forward" - Centre for Wireless Research, Institute for Research in Applicable Computing (IRAC), Department of Computer Science and Technology, University of Bedfordshire, Luton, LU1 3JU, England,2014

[4]. Manjesh N,Prof. Sudarshan Raj ,"SMART HELMET USING GSM & GPS TECHNOLOGY FOR ACCIDENT DETECTION AND REPORTING SYSTEM"- International Journal of Electrical and Electronics Research ISSN 2348-6988 Vol. 2, Issue 4, pp: (122-127), Month: October - December 2014, Research Publish Journals.

[5]. Albert Daimary, Meghna Goswami and Ratul Kumar Baruah ."A Low Power Intelligent Helmet System,2017". Department of Electronics & Communication Engineering Tezpur University Tezpur, Assam, India .

[6]. Rashmi Vashisth, Sanchit Gupta, Aditya Jain, Sarthak Gupta, Sahil, Prashant Rana.,"Implementation and analysis of smart helmet"-4th IEEE International Conference on Signal Processing, Computing and Control (ISPCC 2k17), Sep21-23, 2017, Solan, India.

[7]. Yang Xing, Chen Lv, Member," Identification and Analysis of Driver Postures for In-Vehicle Driving Activities and Secondary Tasks Recognition",- IEEE, Zhaozhong Zhang, Huaji Wang, Xiaoxiang Na, Dongpu Cao , Member, IEEE, Efstathios Velenis, and Fei-Yue Wang, Fellow, IEEE

[8]. Seelam Vasavi Sai Viswanada Prabhu Deva Kumar, Shyam Akashe, Vikram Kumar, "Advanced control of switching ignition using smart helmet"

[9]. Prajitha Prasad,Reshma Mohan Lekshmi Raj,Sreelakshmi, S,Divya R Pillai,"Smart helmet and intelligent bike system:"

[10]. Manish Uniyal;Himanshu Rawat ;Manu Srivastava ;Vivek kumar,"IOT based Smart Helmet System with Data Log System"Srivastava,https://ieeexplore.ieee.org/document/8748790

[11]. International Journal of Innovative Research in Science, Engineering and Technology(A High Impact Factor, Monthly, Peer Reviewed Journal)

[12]. Mr.Serhuram rao,Vishnupriya S.M,Mirnalini Y,Padmapriya RS, "The high security smart helmet using internet of things":

[13]. Chitte P.P., Salunke Akshay S., Thorat Aniruddha, N Bhosale,"Smart Helmet & Intelligent Bike System",- International ResearchJournal of Engineering and Technology (IRJET) Volume: 03 Issue: 05, May-2016.

[14]. Nilesh. M. Verulkar1 , Ankita D. Ravankar2 , Chhaya A. Bharambe3 , Namarata P. Kathale4 ,"Smart Helmet: A review"-Department of Electronics & Telecommunication Engineering, Mauli Group of Institutions, College of Engineering and Technology, Shegaon, Maharashtra.

[15]. Muhammad Qasim Khan and Sukhan Lee ," A Comprehensive Survey of Driving Monitoring and Assistance Systems" Department of Electrical and Computer Engineering, Intelligent Systems Research Institute, Sungkyunkwan University, Suwon 440-746, Korea; qasim@skku.edu

[16]. G. Sasikala , Kiran Padol , Aniket A. Katekar and Surender Dhanasekaran, "Safeguarding of Motorcyclists Through Helmet Recognition", 2015 International Conference on Smart Technologies and Management for Computing, Communication, Controls, Energy and Materials (ICSTM),

[17]. "Konnect : An Internet of Things(IoT) based Smart Helmet for Accident Detection and Notification", Sreenithy Chandran, Sneha Chandrasekar, Edna Elizabeth N Department of Electronics & Communication Engineering Sri Sivasubramaniya Nadar College of Engineering

[18]. Muthiah M1, Aswin Natesh V2, Sathiendran R K3, "Smart Helmets for Automatic Control of Headlamps ",2015 International Conference on Smart Sensors and Systems (IC-SSS)

[19]. A. Ajay, G.Vishnu,V.Kishoreswaminathan,V.Vishwanth, UG Scholar, K.Srinivasan, S.Jeevanantham" ACCIDENTAL IDENTIFICATION AND NAVIGATION SYSTEM IN HELMET", 2017 InternationalConference on Nextgen Electronic Technologies

[20]. Adnan Shaout, Dhanush Mysuru, Karthik Raghupathy," CAN Sniffing for Vehicle Condition, Driver Behavior Analysis and Data Logging"

[21]. Meiring GA, Myburgh HC ,"A Review of Intelligent Driving Style Analysis Systems and Related Artificial Intelligence Algorithms".

[22]. Nilesh M. Verulkar, Swati S. Patil, Namrata A. Gandhi , Komal B. Todkar Assistant Professor, "Smart Helmet: A Protective Headgear System" -Department of Electronics and Telecommunication Engineering, Mauli Group of Institution's, College of Engineering and Technology, Shegaon, Maharashtra, India1 PG Students, Department of Electronics and Telecommunication Engineering, Shree Sant Gajanan Maharaj College of Engineering, Shegaon, Maharashtra, India

[23]. Prajitha Prasad A, Reshma Mohan, S Lekshmi Raj, Sreelekshmi S, Divya R Pillai," Smart Helmet And Intelligent Bike System"

[24]. R S Saravanakkumar, Mr.Muniraj "ACCIDENT ALERTING SYSTEM TO SAVE BIKERS USING SMART HELMETS"- international journal of advanced research trends in engineering and technology (IJARTET) Vol. 3, special issue 3, april 201

[25]. Sivakumar, Dhivya,"Smart Helmet System Using Alcohol Detection For Vehicle Protection", international journal of advanced science and engineering research www.Ijaser.In volume: 1, issue: 1, june 2016 ISSN: 2455-928

[26]. P.Dileepkumar, G.N.Kodandaramaiah, A.Subramanyam, M.Dharani, "A SOLAR POWERED SMART HELMET WITH MULTIFEATURES"- International Journal of Engineering Inventions e-issn: 2278-7461, p-issn: 2319-6491 volume 4, issue 10 June 2015.

BIOGRAPHIES

Deepak K.N, Assistant Professor of Department of Computer Science and Engineering at Universal Engineering College, Vallivattom, Thrissur

Anjali Baburaj, A student of Department of Computer Science and Engineering at Universal Engineering College, Vallivattom, Thrissur

Reshma N.S, A student of Department of Computer Science and Engineering at Universal Engineering College, Vallivattom, Thrissur.

Thasni V.T, A student of Department of Computer Science and Engineering at Universal Engineering College, Vallivattom, Thrissur.

Yadhu Krishnan P, A student of Department of Computer Science and Engineering at Universal engineering College, Vallivattom, Thrissur.