Design of Smart Helmet for Accident Avoidance

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ABSTRACT: The theme of our design is Helmet Wearing System. In India, nearly 200 million people commute by two- wheelers every day. The main purpose of this helmet is to give safety for the rider. This can be enforced by using Artificial Intelligence. Our intention is to make our country a safe riding terrain. It should try to find whether the motorcycle rider is wearing a helmet or not in realtime. Driving without a helmet is like danger one's life. In the event of an accident, a motorcycle lacks the structural support that a auto does to keep motorists safe and defended. Indeed when a rider takes all possible preventives, accidents performing in injury still do the proposed system design of smart helmet for accident avoidance Road accidents are adding in our country, utmost of them are caused due to negligence of not wearing the helmet, drink and drive and over speeding which numerous leads to death or severe injuries due to lack of medical treatments handed to the injured person at right time. This motivates us to suppose about making a system which ensures the safety of biker, by making it obligatory to wear the helmet by the rider to help head injuries that may lead to immediate death, help drink and drive script by testing the breath of the rider before the lift, help over speeding and rash riding by waking the rider and also to give proper medical attention, if met with an accident by notifying the concerned person with the position details
KEYWORDS:Machine Learning, Credit Card Fraud, detection,Random forest algorithm

I.   INTRODUCTION

        A helmet is a form of defensive gear worn to   cover the head from injuries. More specifically, a helmet aids the cranium in guarding the mortal brain when accidents do. The design aims to   give total safety for bike riders. neglectfulness and drunk and drive is the major factor for numerous accidents. The business authorities give a lot of instructions to the vehicle drivers. But numerous of them don't observe the rules. lately helmets have been made mandatory, but still people drive without helmets. Despite creating important mindfulness about the accidents and significance of wearing helmet, people violate the laws. Business police covering for helmets isn't the endless result. As business police can not be present at all places. Hence to make the helmet obligatory this smart helmet with accident forestalment system is innovated. This system will start the vehicle if the motorist wears the helmet and should be non- alcoholic. While driving if the riders palpitation goes abnormal he can not concentrate in driving for this a buzzer is used to indicate the other riders about the riders abnormal condition which ultimately makes the others to   decelerate down their speed so that accident and injuries can be avoided. All this process can be done by using microcontroller, a RF module which communicates the data wirelessly, a relay for the actuating and a buzzer for the sound suggestion .Present assiduity is decreasingly shifting towards robotization. Two principle factors of moment's artificial robotizations are programmable regulators and robots. In order to prop the tedious work and to serve the humanity, moment there's a general tendency to develop an intelligent operation. The proposed system " **SMART IOT HELMET** " is designed and developed to negotiate the colorful tasks in an adverse   terrain of an assiduity. The intelligent machine is loaded with several units similar as Alcohol detector & Receiver, TV, microcontroller, RF transmitter and receiver that synchronously

work with the help of a launch- of- the- art Arudino Uno 1 microcontroller. This system is an owe to the specialized advancement. This prototype system can be applied effectively and efficiently in an expanded dimension to fit for the demand of artificial, exploration and marketable operations.

In this paper(1) currently, road accidents are one of the major causes that leads to mortal death. In-between, the motor bike accidents are common and effects critical injuries. Helmet is one of the important safety unit for a motor bicycle riders. still, numerous fail to conform to the law of wearing helmet. Then, to descry the motorcycle riders who are breaking the helmet rules, a unit using picture processing and convolutional neural network is applied. The system correspond of motorbike discovery, helmet vs no helmet bracket and motorbike licence plate recognition. The unit substantially inclues of 3 corridor – discovery of motor-cycle, discovery of helmet and sensing of license plate of motorcyclists riding no helmet. The foremost criteria is to determine whether the captured image is having a motorcycle or not using overeater, and checking whether the motorcyclist is wearing a helmet or not by usingCNN.However, also the license plate of the motorcyclist is honored using tesseract OCR, If the motorcyclist is linked without a helmet. The delicacy attained for motorcycle/ non motorcycle bracket is 93, helmet/ no- helmet bracket is 85 and license plate recognition is 51 performing in an average delicacy of around 76. The delicacy can be bettered by adding the training data set and image quality.

In this paper(2) Motorcycle accidents have been fleetly growing throughout the times in numerous countries. Due to colorful social and profitable factors, this type of vehicle is getting decreasingly popular. The helmet is the main safety outfit of motorcyclists, still numerous motorists don't use it. The main thing of helmet is to cover the motorists head in case of accident. In case of accident, if the motorcyclist doesn't use can be fatal. This paper aims to propose a system for discovery of motorcyclist without helmet. For this, we've applied the indirect Hough transfigure and the Histogram of acquainted slants descriptor to prize the image attributes. also, the MultiLayer Perceptron classifier was used and the attained results were compared with others algorithms. Business images were captured by cameras from public roads and constitute a database of 255 images. Indeed, the algorithm step regarding the helmet discovery fulfilled an delicacy rate of91.37. ANon-Helmet Rider Discovery system is developed where a videotape train is taken

asinput.However, and also then we're uploading an image to identify the license plate number of that motorcycle is uprooted from image and displayed, If the motorcycle rider in the videotape footage isn't wearing helmet while riding the motorcycle. OCR is used for license plate number birth if the rider isn't wearing a helmet. Not only the characters are uprooted, but also the frame from which it's also uprooted so that it can be used for other purposes. All the objects of the design are achieved satisfactorily.

In this paper[3] ensure the safety of workers and the stable operation of the power grid, the power grid companies in China have developed a very strict safety control system which contains many regulations, such as safety regulations and the two-ticket regulations. However, some workers are still lack of safety awareness in that they even do not wear safety helmets when carrying out construction or maintenance projects in substations. Safety helmet is an indispensable safety tool in electric power work, which can maintain the head safety of workers at all times and avoid fatal injuries such as electric shock and strike. Working without safety helmet is not only a violation of the safety control system, but also a manifestation of not being responsible for personal life and property. Nevertheless, the existing control means can not identify and prevent such behavior timely, efficiently and accurately. In order to better avoid this unsafe behavior, this paper proposes the Improved Faster R-CNN algorithm to inspect the wearing of safety helmet. Considering the real situation, the Retinex image enhancement is introduced to improve image quality for the outdoor complex scenes in substations. K-means++ algorithm is also adopted for better adaptation to the small size helmet. The experimental results show that compared with the Faster R-CNN algorithm, the mean average precision of the Improved Faster R-CNN is improved and the real-time automatic detection of the wearing of safety helmets is realized.

In this paper[4] In this have reviewed the recent trends in developing Smart Helmet system. The smart helmet system is used to prevent the accidents in motor bikes and to identify the bike accidents on time for wellness of human being. Also, the smart helmet system analyzed in this paper is used in mining industry for safeguarding the miners from hazardous events in the mine and to alert the miners from hazardous gas emissions inside it. The research also helps to understand the smart helmet system evolved over the period and currently by using emerging technology like Internet of Things (IoT). This work also addresses

the intelligent motor bike helmet system which is used to inform the rider about rear big trucks/buses for avoiding collisions. Once the rider starts the bike, during the ride if any accident occur then mems sensor detects the crash and a attached Wi-Fi module will send alert messages to mobile through blynk application and also to nearby friends using these application. In proposed system push button represents the helmet, if push button is in released condition it represents helmet not weared, if push button is in hold condition it represents the helmet weared, Led lights represents the bike head lights, which are in OFF condition during day time and in ON condition during night time and DC motor represents the ignition of bike, DC motor runs when relay is closed. Relay operates when above two conditions are satisfied and ignition bike starts.

In this paper[5] the ongoing patterns in creating Smart Head covering framework. The shrewd head covering framework is utilized to forestall the mishaps in engine two-wheeler and to recognize the two-wheeler mishaps on schedule for health of individual. Additionally, the brilliant head covering framework dissected in this paper is used in digging industry for defending the excavators from dangerous occasions in the mine and to caution the diggers from unsafe gas emanations inside it. The exploration additionally assists with understanding the shrewd head covering framework developed over the period and as of now by utilizing rising innovation like Internet of Things (IoT). This work likewise addresses the canny engine two wheeler head covering framework which is utilized to educate the rider about back huge trucks/Buses for dodging crashes. Currently we are in the process of finding an appropriate design for the helmet. The proposed helmet should accommodate all the needed facilities in a compact manner. In parallel, the selection of microcontroller and sensors are being taken care. The proposed design will give a solution in terms of cost effective and updated technology front for all kinds of helmets. The aim is to target the two wheelers segment and then bi cycle users with lighter version. This cost effective solution can be integrated with engine start and other needed safety aspects

II. EXISTING SYSTEM
The present concept is there is not such smart helmets are in existence. There are many advancements, which gives safety for cars only. Meanwhile there are some technologies, which create such smart helmet to provide the safety for the bike riders and to prevent accidents. The present concepts serve only three main purpose.

They are helmet detection, alcohol detection and accident prevention. The widest technology used is the Zig bee technology for wireless communication with some microcontrollers. As the bikers in our county are adding, the road mishaps are also adding day by day, due to which numerous deaths do, utmost of them are caused due to most common negligence of not wearing helmets. In addition, numerous deaths do due to lack of prompt medical attention demanded by the injured person.

III. PROPOSED SYSTEM
The proposed system of this project is to make sure that the bike riders follow basic traffic rule so that we can avoid most of the accidents. To alert riders family and friends in the cases of any accident occurrence. To make sure that the rider get any need medical attention to prevent some serious fatalities.To save human lives in general and prevent any misfortunes in accidents. Driving without a helmet is like risking one's life. In the event of an accident, a motorcycle lacks the structural support that a car does to keep drivers safe and protected.

Even when a rider takes all possible precautions, accidents resulting in injury still occur.The primary objective of a helmet is to protect the driver's head in case of an accident or fall from a bike. Now a days use of helmets is low. The proposed project helps to identify whether motorcyclists wear safety harnesses that is helmets while driving or not.
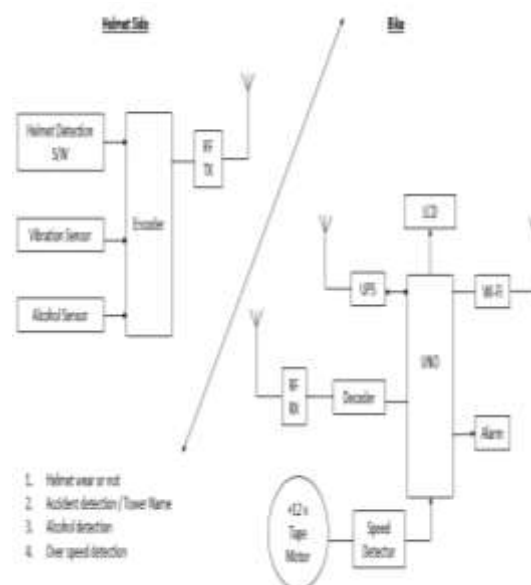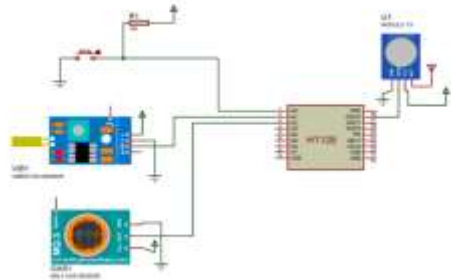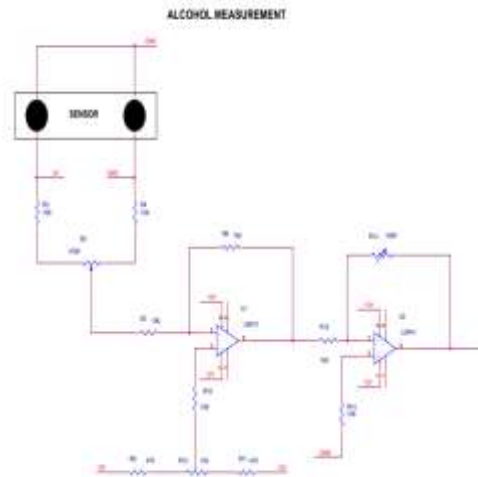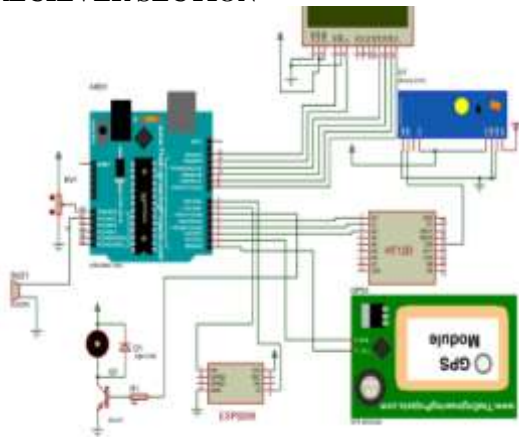
BLOCK DIAGRAM

Figure 1: Block Diagram

CIRCUIT DIAGRAM

RECIEVER SECTION

IV. EXPERIMENTAL RESULT

The theme of our project is Design of Smart Helmet for Accident Avoidance. In India, nearly 200 million people commute by two-wheelers every day.The main purpose of this helmet is to provide safety for the rider. Our intention is to make our country a safe riding environment. It should try to identify whether the motorcyclist is wearing a helmet or not in real-time.

ALCOHOL SENSOR

An alcohol sensor detects the attentiveness of alcohol gas in the air and an analog voltage is an output reading. The sensor can activate at temperatures ranging from -10 to 50° C with a power supply is less than 150 Ma to 5V.

LCD DISPLAY CIRCUIT AND NOTES

LCD (Liquid Crystal Display) screen is an electronic display module.These modules are preferred over seven segments and other multi segment LEDs.A 16x2 LCD means it can display 16 characters per line and there are 2 such lines.

BLOCK DIAGRAM
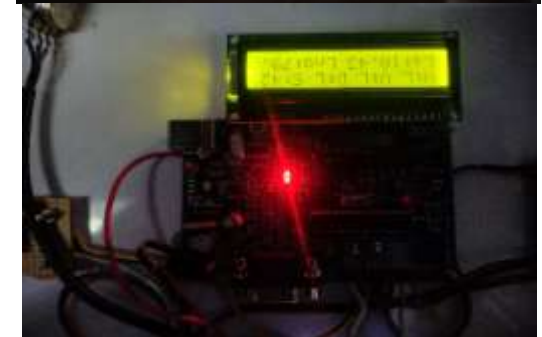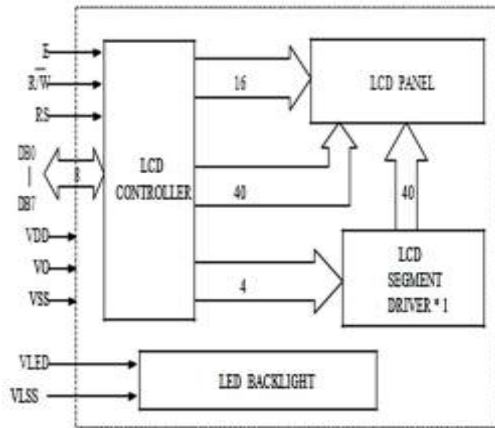
V. CONCLUSION

The progress in science & technology is a non-stop process. New things and new technology are being invented. As the technology grows day by day, we can imagine about the future in which thing we may occupy every place. The proposed system based on Atmel microcontroller is found to be more compact, user friendly and less complex, which can readily be used in order to perform. Several tedious and repetitive tasks. Though it is designed keeping in mind about the need for industry, it can extended for other purposes such as commercial & research applications. Due to the probability of high technology (ARDUINO microcontroller) used this" **MULTIPURPOSE HELMET USING IN VECHILE SYSTEM**" is fully software controlled with less hardware circuit. The feature makes this system is the base for future

systems. The principle of the development of science is that "nothing is impossible". So we shall look forward to a bright & sophisticated world.

VI. FUTURE WORK

The above mentioned solutions are either dependent on some hardware such as sensors that have to be present in the car or require a smartphone to be present within the vehicle. Although the use of such hardware turns out to be a more cost-efficient approach, it has the drawback of being destroyed in the accident and hence giving false or no readings at all. Therefore, a competent solution that does not depend on any hardware device or sensor is required for the prevention of traffic accidents. Further improvisations include installing a vision system for recording the activities of the driver. The controlling authority for monitoring the traffic and safety rules can use the recorded information then. It can be upgraded by mounting the wireless transmitter on cars, which is helpful for enhanced communication vehicle to vehicle.

REFERENCES

[1]. Helmet Detection and License Plate Recognition Using CNN Emy Barnabas1 , AmrithaB.J IEE Transaction 2019

[2]. Helmet Detection on Motorcyclists Using Image Descriptors and Classifiers kelson romulo teixeira Aires IEE Transaction 2020)

[3]. Detection of Safety Helmet Wearing Based on Improved Faster R-CNN-Songbo Chen Zhejiang University College of Electrical Engineering Hangzhou, China(2020) IEEE

[4]. Analysis of Smart helmets and Designing an IoT based smart helmet: A cost effective solution for Riders Divyasudha N, Arulmozhivarman P School of Electrical Engineering Rajkumar E.R VIT University, Vellore(2020) –IEEE

[5]. Akshatha ,Anusha, Prema, Anitha, Prof. RumanaAnjum,Smart Helmet for Safety and Accident Detection using IOT International Research Journal of Engineering and Technology, Volume 6, Issue 3 ,March 2019.

[6]. JesudossA,Vybhavi R ,AnushaB,Design of Smart Helmet for Accident Avoidance, International Conference on Communication and Signal Processing, April 4-6 ,2019.

[7]. Shoeb Ahmed Shabber, MerinMeleet, Smart Helmet for Accident Detection and Notification,2nd IEEE International Conference on Computational Systems and Information Technology for Sustainable Solutions ,2017.

[8]. Manjesh N, Prof. Sudarshan Raj, Smart helmet using GSM and GPS technology for accident detection and reporting system, International Journal of Electrical and Electronics Research Volume 2, Issue 4, October – December 2014.

[9]. K. Venkata Rao, Shivani D Moray, Shraddha SR , Vandana, Varsha K, IoT based smart helmet for accident detection, International Journal of Technical Research and Applications Volume 6, Issue 2,MARCH-APRIL 2018, PP.82-84.