Accident and Alcohol Detection for Two Wheelers Using Node Mcu

B Tharunika[a], H Deepak Kumar[b], K ShaliniReddy[c], DR G A E SatishKumar[d]

[a][b][c] Department of Electronics and Communication Engineering,

Vardhaman College of Engineering, Hyderabad, India.

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Abstract: This paper gives description of a smart helmet to avoid Accidents on road. If he/she alcohol consumption level is more and did not wear a helmet the ignition will not on.If the rider met with an accident than immediate alert message will sent to the family member using GSM and the entire data is monitored using thingsboad

Keywords: Node MCU, Accelerometer, Alcohol Sensor, Limit Switch,GPS,GSM.,Arduino IDE

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1. Introduction

In the last decade, the number of improvements in smart helmet has been quite ever yet a big number ofserious road accidents after still occur everywhere the planet. The most reason for road accidents are caused by humanmistakes, violating traffic rules, usage of mobile, eating and drinking while driving. this might cause severehead injury and death. Previous study indicates that 25%-30% of accidents are associated with the violation of traffic rules.More than 70% of riders drive without wearing helmet with none specific reason. consistent with the report providedby the Indian government, in every hour 55 accidents occur and 70% lost their life on road thanks to accidents.480652accidents happen alone in 2016.Approximately 60000 traffic accidents happen thanks to sleepiness problems. Theaccident also happened due to speeding, drunk driving and lack of experience or focus. 61% of road accidents arecaused by over speeding. The age bracket between18-45 features a major share (68%) within the number. In most of the countries, motor riders are forced to wear the helmet and to not over speed the vehicle but the riders arestill violating the principles. to beat this issue, researchers worked by using the methods like auto ignition that motordid not start until the rider wear the helmet on his head. Many sensors also are been wont to avoid accidents. Someother methods also are looked into, record the speed data, limit the over speeding, the medical services are often providedfor injured people when an accident occurs using GSM, tracking the vehicle location using GPS..

2.Literature Review

[1] The intelligent bike system detects whether the rider is wear the helmet. It also checks the wheather the rider is alcoholic or not while driving. There we've a RF-Tx in the helmet and RF-Rx in the bike. to making sure the wearing of helmet by the rider, a switch is employed. the right placing of the helmet is ensured by the ON condition of the switch provided within the helmet. To detect the presence of alcohol, an MQ-sensor which detects alcohol is placed almost in the mouth of rider within the helmet. RF encoder is employed to code the info to be transmitted to digital signal and transmitted through the RF module. If any of the given conditions is violated, then engine are going to be OFF. Microcontroller is employed to regulate the relay function utilized in the bike module and also control the engine through the relay interfacing unit.

[2]In the work design ,Matlab / Simulink is employed for implementation. Fuzzy logic is employed to spot Current driving style. Use a sign from navigation system referred to as road class. There are two methods utilized in symbolic logic system that are fuzzification and defuzzification, these concepts are utilized in the work.

[3] During 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 may be a big issue while using this technology.

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[4] This paper introduces a sensible 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 most goal of this system is make sure the rider is boozed and wearing the helmet. Helmet module contain alcohol sensor, Fog sensor. Fog sensor used for increase the visibility within the case of smog. Helmet contain RF transmitter to gather the info and send to the RF receiver within the bike unit. RF receiver sends the info 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 EHELMET, is used to pay the cash to the toll or other situation

[5] During this paper, supported driving status we are analyzing the driving force behavior and assist in driving task. Categories the task in to safe driving task and dangerous and distracting tasks.Kine ct is employed to gather the driving force behaviours signals. Here the various tasks are identified using feed forward neural network (FFNN).used in real time monitoring study, system is benefit for future ADAS design.

[6] The paper introduces an auto ignition and a theft security system. to form the transmission between the transmitter and therefore the receiver, a Bluetooth wireless communication module is employed. The engine are going to be remains OFF, if the driver shouldn't wear the helmet. The engine are going to be ON automatically, when the rider kept the helmet. In the sensor, Bluetooth wireless communication module connected to the bike receives the knowledge. Two modules are there: One is that the helmet and other is that the bike. to speak the bike with helmet, encoder, wireless data Rx and a Tx are used. AT mega controller is employed as a CPU in both the helmet and bike modules. The aim of this project is to guard the lifetime of the rider and thus reduce the death rate at accidents on road by push the rider to wear the helmet using auto ignition.

[7] The system mainly consists of two modules. One is the helmet module & other is the bike module. Switches are provided within the helmet that pass the incoming signal to RF transmitter through microcontroller unit. These switches make sure the wearing of helmet in proper place. If the helmet wears, the switches turned ON and ignition of the vehicles will starts. After ignition ON, the system records the info of the rider while riding. the info includes speed, accident and helmet status and site 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 into the server. Microcontroller control all the sensors and modules. Http protocol is employed to transmit data from the MCU and logged into the server and therefore the library files are implemented using python language. The authorised persons from anywhere can access the info of the rider or keep trace out of the vehicle and status of the driver.

[8] The most motive of the project is accident detection, notification and prevention. The system uses WIFI based raspberrypi3 controller which is that the networking system. The cloud-based services are wont to interface Bluetooth and raspberry pi. The receiver contacts are recorded within the database and can send messages to the receiver. Various sensors like pressure sensor, voice sensor, regulation sensor, vibrate sensor are used and these are controlled by raspberry pi3. When an accident occurs, then the info 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 signal sensor makes the rider to obey trafficrules.

3.HARDWARE IMPLEMENTATION:

NodeMCU

NodeMCU is an open source Lua based firmware for the ESP8266 WiFi System On Chip (SOC) from Espressif.It has an programmable Wi-Fi module.It consists of 10 general purpose input output (GPIO) pins and SPI communication
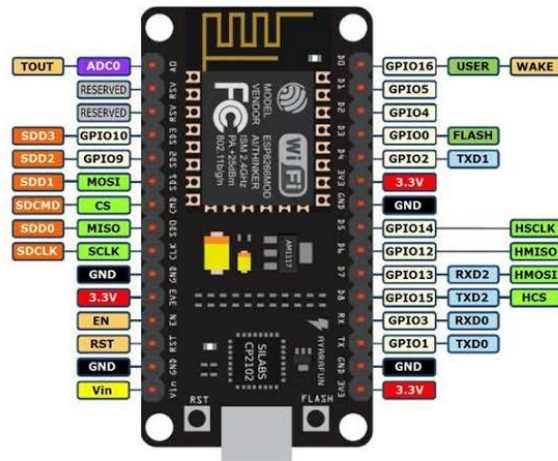
Fig.1 Node MCU

Alcohol Sensor

Alcohol sensor detects the presents of alcohol in breath. This sensor can activate at a temperatureranges from 10 to 50 degree. Power supply are going to be but 150 mv to 5v. This sensor is especially used for traffic policenow days. MQ-6 is one among the famous sorts of alcohol sensor which is suitable for breath analyzer. it's wont tochecking the concentration of alcohol during a sample and mainly employed by traffic police.

Fig.2 MQ-6 Sensor

Accelerometer

Acceleration forces are measured by using the accelerometer. it's employed by many mobile devicessense movement or vibrations. It measure the change in speed or velocity divided by time. By using accelerometer, theuser are often determined whether an object is move to uphill or whether go over , or if tit tilts, its fly horizontally ordownward.

Fig.3 Accelerometer

GSM

GSM is which is widelyused for communicate through mobile. GSM uses TDMA GSM & CDMA.GSM compress the info and digitized. Then the info sends through a channel with otherstreams.

The channel mainly uses two streams of user data and every have a slot itself. The GSM operates at thefrequency band of 900 MHz or 1800 MHz.

Fig.4 GSM

GPS

GPS is used to navigate a location based on latitude and longitude and used for continuous tracking of a vehicle.

Fig.5 GPS

WIFI (Wireless Fidelity)

WIFI provides network connectivity by using radio waves. A wireless adapter is employed establish a connection to makehotspots and therefore the wireless router. it's a world popular wireless networking technology that uses radio emission to supply highspeed of internet and network connection and supported IEEE 802.11

4. Proposed Design

Proposed system uses limit switch to know the helmet status and alcohol sensor to detect driver alcohol status. If helmet detected, ignition key is on and alcohol not consumed by driver, vehicle gets started. Neo 6M GPS used to monitor the location of vehicle and track vehicle continuously. Accelerometer used to know the vehicle driving safe or any accident detected using inclination of vehicle. The complete data send to thingsboardIoT cloud platform using Wi-Fi. The data generated from sensors read by controller and convert data to JSON format using ArduinoJSON library. This JSON data send to thingsboard cloud platform using http protocol. A beautiful dashboard is created in thingsboard to display complete system using maps, table for storing data up to 30 days and various digital gauges.
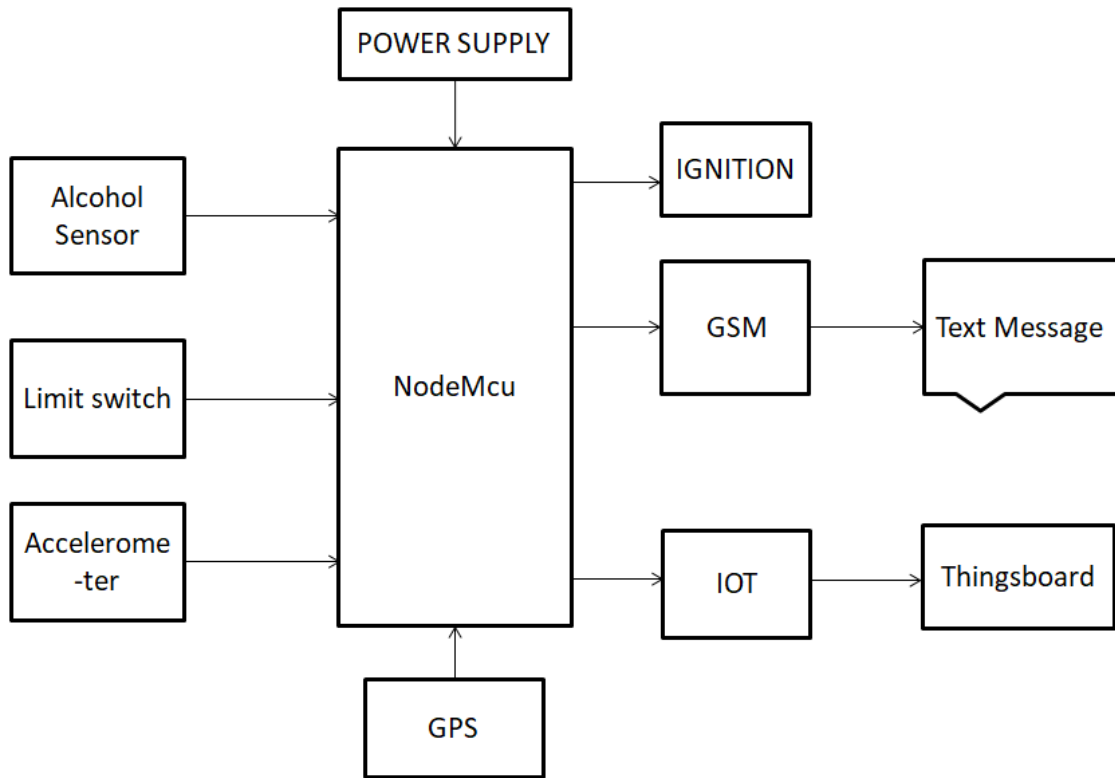
Fig.6Block Diagram

4. Algorithm

Step1: Initializes all sensors connected controller board.

Step2: Check's ignition key state, Alcohol state and helmet state.

Step3: Find longitude and latitude of vehicle using Neo6M GPS Module.

Step4: Continuously monitoring of vehicle accident status using accelerometer.

Step5: Connecting to Wi-Fi Communication and establishment of communication between controller and IoT cloud platform using HTTP.

Step6: Sends data to Thingsboard Cloud platform using HTTP and create dashboard for display data graphically.

Step7: If any accident detected, sends alert to family members using GSM technology including location link.

Step8: Re initialize system and repeat same process continuously.
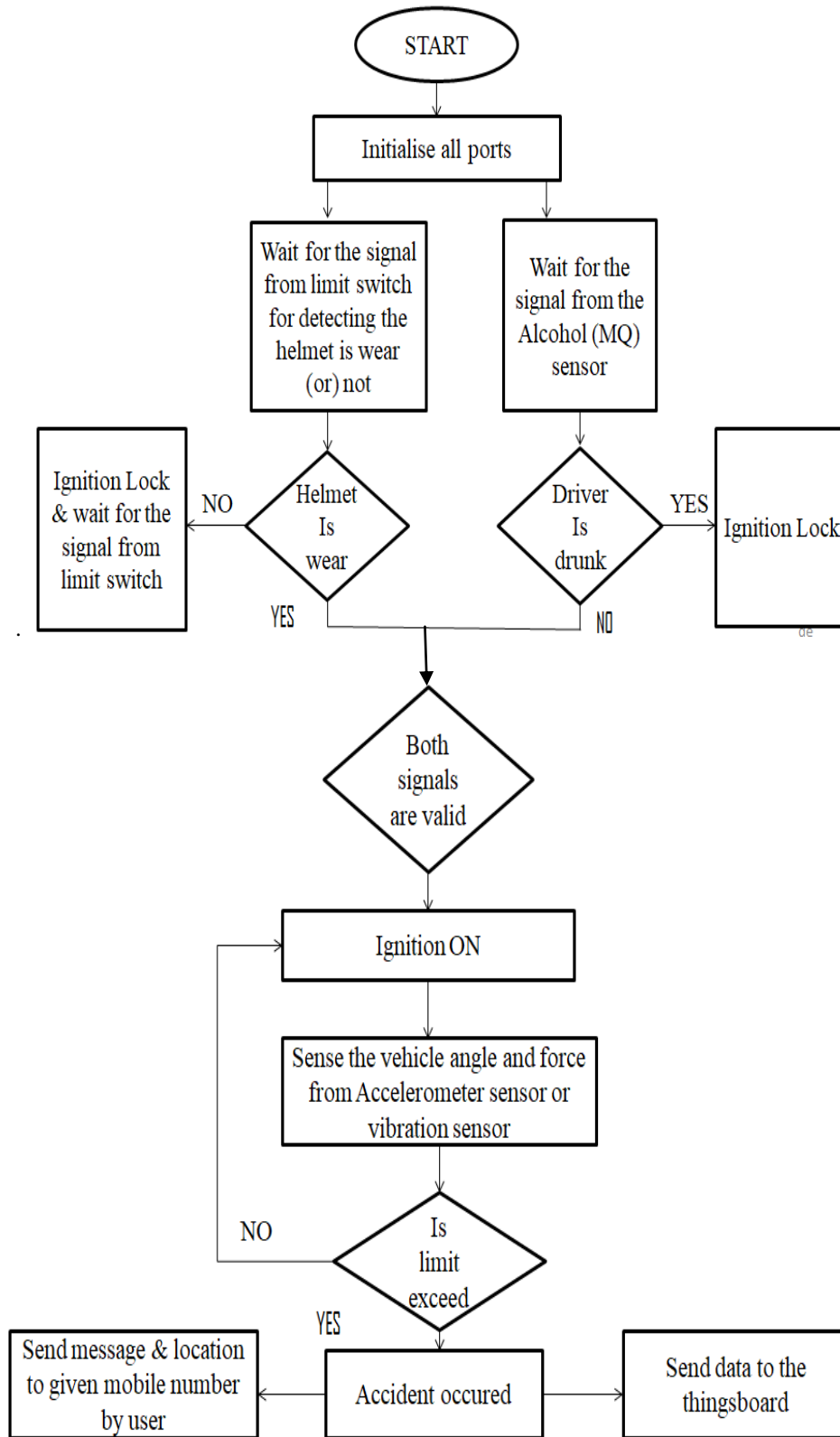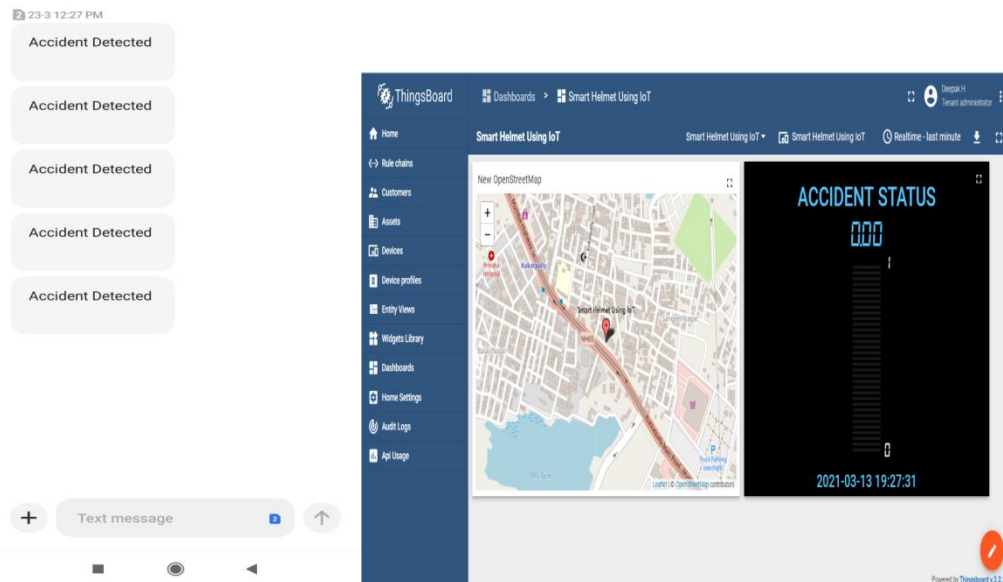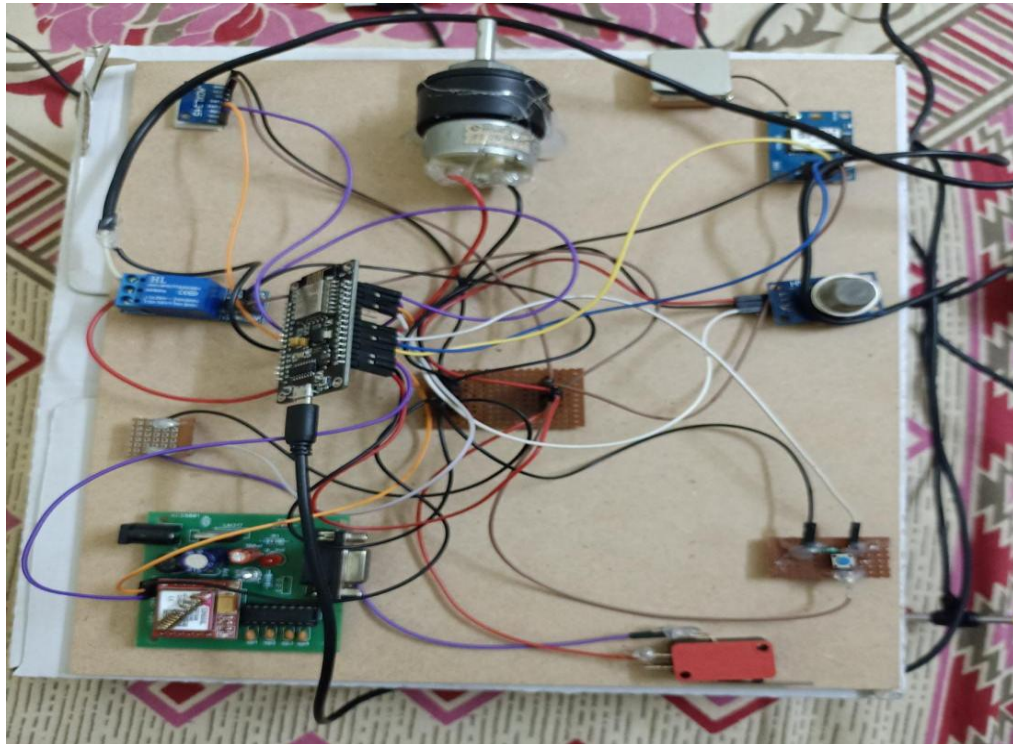
5. Flow Chart

Fig.7 Flow Chart

6.Results

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7.CONCLUSIONS

The overall conclusion of the project is we can avoid many road accidents.If the he/she don't wear helmet and incase if the driver is drunken the ignition will not turn on. Unfortunatelyif the driver is met with an accident using gsm and gps system the information will be delivered immediately with their family members as well as the accident occurred location can be seen in google maps with the help of latitude and longitude of gps coordinates in thingsboard.So he/she can be rescued and medical help.By this way we can reduce road accidents and save their lives.

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