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Multifaceted Helmet

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Abstract:

Rode safety for the driving force has emerged as an indispensable issue underscoring the leading reason for fatalities . Each single day witnesses a noteworthy escalation in the emergence of the number of vehicles on the roads therefore the collision amongst the vehicles is additionally on an exponential surge at the same time, in such a harmful state of affairs, the project aims as acting as a panacea to this predicament and this saving countless lives on roads. One of the leading causes of road accidents is reckless driving. Many drivers often engage in dangerous behaviors such as speeding, distracted driving, and driving under the influence of drugs or alcohol. The objective of our project is to design a low-cost intelligent helmet that is capable of identifying alcohol consumption and preventing road accidents. The main purpose of this smart helmet to provide safety for rider. This is implemented by using advance features like alcohol detection, accident identification, location tracking, used as a handsfree device, solar powered, fall detection. In our project, its compulsory to wear helmet, without helmet ignition switch cannot ON. If rider is drunk or if accident takes place, then automatically ignition switch is locked, and a message will be send automatically to their registered number with their current location. It provides a feature to receive a call while driving by using Bluetooth.

Keywords: Smart Helmet, IoT, GSM, GPS, Sensors, Accidents Prevention, Alcohol, Message, Bikers, Ultrasonic, Safety

Introduction:

The previous decade witnessed a number of advancements in the arena of smart helmet encompassing the broader sector of road safety however the same decade also saw a significant escalation in the number of fatal road accidents across the globe. Majority of the accidents were in the wake of human errors for instance distraction due to mobile phones, violation of the traffic norms , alcohol intake, eating and drinking while driving. Such a negligence further invites a severe head injury and often proves to be deadly. Data underscores the fact that violation of traffic rules invites about 25% - 30% of the overall road accidents. The situation has imperative dimensions in the developing and the less developed countries where the traffic accidents account for a major share of fatalities hampering a healthy life and ranking eleventh amongst the other causes of deaths. In a developing country like India, road widening can be the another consequential panacea to the predicament of road accidents.

The number of riders not wearing a helmet is surging day by day which is 70 % of the total riders on the road. A recent report by the Government of India reveals that every hour witnesses 55 road accidents and more than 70 % of such accidents are fatal and the remaining 30 % are injurious. 2016 alone saw about 480652 accidents due to negligence of the riders. Sleepiness is another hurdle that alone accounted for about 60000 accidents in the very year.

Some other factors, according to the report, were speeding, inexperienced driving or for want of focus during driving, Driving under influence (DUI) The challenges arising in the drunk driving control mechanisms can be addressed by various concrete steps and principles with effective implementation at all levels national, state or local by decentralisation of power and tracing the accountability of the authorities. Drunken Driving under Unfluence (DUI) is a hurdle that needs a check at all apparent levels. This mechanism will further attract public attention by the proficient utilisation of media which will collect as a database for all problems arising and their solutions where the solutions can also be proposed by the public. This mechanism equipped with public support is bound to produce tremendous improvements.

This kind of a database equipped with public suggestion will not have a narrow instant solution focussing on a single step but it will have an extensive approach with an eye towards the long term betterment . The same will also lay the bedrock for an easy analysation and manipulation of the situation making it more favourable in the long run. Interestingly about 61% of the total road accidents are the consequence of overspeeding encompassing the age group of 14-45 which forms a major share of about 68 % of the total accidents on riad. A survey underscores the fact that India loses at least 4 citizens every hour for want of a helmet in a road accident. A noteworthy data was shared in 2017 that spoke about 48,746 deaths in road accidents. Ironically, 78.3 % of the riders died due to the absence of a helmet. Many designed systems have proposed two basic constituents for the model that included a pressure sensor to check if the helmet is worn and an alcohol sensor to keep a track on DUI. A protective helmet is a smart headgear to make the driving safer. The constituents like alcohol detection, location tracing and accident identification, fall detection etc make it an ideal device for a safer journey. The byke functions in a synchronisation with the helmet and starts only if the rider wears and satisfies the conditions of the helmet which turns on the ignition switch. The communication function between transmitter and received is satisfied by the RF module. In case the rider is drunk, the ignition gets locked and data is automatically shared with the number and the location . Any accident will communicated through GSM and GPS.The protective and preventive helmet also used various sensors as it's key constituents. Many researchers also examined various other extensive coverage to this system for instance speed data recording, over speeding detection and limitation, provision of immediate medical assistance after a mishap, tracking the accidents followed by immediate response with the help of GPS and GSM . The proposed model will assist in the provision of immediate notification with the deployment of sensors and this the entire IoT framework will prevent the escalatiom of road accidents and the loss of lives. The proposed system, before executing a specified module deals with various datasets backed by communication and sensor networks.The algorithm elucidated in the report in the forthcoming section depicts the system reaction during a road accident and hence highlights the promising outcome proposed by the system by the amalgamation of IoT in this sector. In the time coming, the system will witness an exponential escalation in its utilisation similar to a smart phone as this system envisages a safety system on road and thus has a massive scope and prominence in saving an individual's life.

Literature Survey:

Jesudoos [1] projected a mechanism, wherever detectors like IR sensor, vibration detector and gas detector, mems square measure used. The gas detector is employed to find the number of liquor he had consumed by checking the breath of someone carrying the helmet. The bar management of the vehicle is handled by MEMS. Accident is detected by vibration detector. Load of the vehicle is recognized by load checker. The Sensors square measure interfaced with the PIC microcontroller. The gas detector can find if a user consumed alcohol and show on the light-emitting diode show. If associate degree accident happens the vibration detector, sense the accident and send info through GPS to the hospital .If there's any rash driving is completed by the rider the acculturation detector find the number of the person from his checking account. to envision whether or not the rider is carrying the helmet or not IR detector is employed. during this system exactitude and accuracy square measure high and car is engaged mechanically supported 10 location.

K.M. Mehata [2] projected a techniques which offer safety to the employees or to spot any fall of the employees in operating space. The projected system has 2 elements. One is that the wearable device engineered victimisation sensors and electronic components. Another part isthat the cell

phone. The communication between the 2 elements is provided by GSM module. These devices conjointly monitor the health and safety of the employee is unendingly. this method ensures smart fall detection and alert the register person to offer medical attention.

Divyasudha N [3] projected a system consists of small controller, position detector, Alcohol detector, electricity detector, RF Transmitter, IOT Modem, GPS receiver, Power provide & electrical device to avoid the accidents and check the alcohol consumption. during this system 2 condition is checked that's whether or not the rider is carrying the helmet or not and to envision whether or not he had consumed alcohol or not if this is often not followed by the rider the bike won't begin and it's indicated by beep sound. If any accident Occur it's up on to predefined variety and station victimisation IOT electronic equipment. this method is price economical compare to alternative quite helmets.

Manish Uniyalet [4] projected a system with 2 units that's helmet unit and 2 wheeler unit. RF receiver of the matching frequency provides the helmet position information to the 2 wheeler section. The microcontroller placed on the TW section can have info of the helmet position that is unendingly checked. There square measure varied alternative sensors like measuring system (tilt angle measurement), Hall-effect detector (speed measurement), GPS module (location pointer) placed

on the TW vehicle. The sensors collect the info and send the info to the microcontroller then if there's a net association then it's sent to the server. The speed of the vehicle are often accessed by the folks at any instant by this technique. during this system folks will access the speed of the vehicle. oldsters will see that's their kid have worn helmet or not.

ShoebAhmed Shabbeer [5] projected the sensible helmet technique that find and report the accidents. during this technique they use microcontroller interfaced with measuring system and GSM module. The notification and report of the accident is provided victimisation cloud

infrastructures. during this technique if the amount of the acceleration exceeds than the brink or if any accident happens the knowledge is shipped to the emergency authority server that then sends the message to the assigned emergency contact through GPS module. The results of this method was ready to determine accidents is of ninety four.82% and sends the proper coordinates ninety six.72% of your time.

P.Rojaet.[6] has projected a system consisting a vi units as follow, that's remover detector, IR sensor, Air quality detector, Arduinouno microcontroller, GPRS, GSM. This helmet provides the alert regarding the harmful gases within the mining areas to the employees and conjointly proven info to the server if helmet is removed. Here this information transmission is completed victimisation IOT technology .

Limitations and challenges:

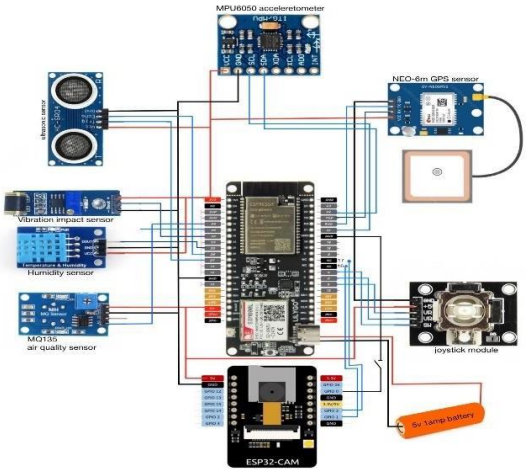
1. Bikers do not wear helmets in the region where traffic checking is not done.

2. There is a tendency of the driver to wear helmet only where the anticipate checking may takes place, they do not wear helmet where no checking is done.

3. The vehicle may be turn on or may be stolen by passing the ignition switch.
4. Testing alcohol content present in blood in each individual rider in big countries like India is almost impossible.

5. Accidents due phone calls as previous helmets do not contain Bluetooth speakers.

System Architecture:



Circuit Digram

Conclusion:

Multifaceted Helmet is a solution to the predicaments related to road accidents. Offers multiple advantages and concrete protection to bike riders.

Accidents are inevitable despite taking cautions.

The model includes an engine cut off mechanism that reduces the chances of accidents.

The mechanism acts as an unmanned policeman that plays the role of "checks and balances"on the rider.

This mechanism adds more safety to the roads.

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