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Accident Prevention and Reporting Smart Vehicle System

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ABSTRACT: In today's world, safety and security are the two important criteria, which needs much attention. The crucial reason behind the death cases and severe injuries are mostly because of two-wheeler accidents. In India it has been reported that for every four minutes, there is one death being reported. Now-a-days two wheeler accidents are increasing rapidly due to the consumption of alcohol and also due to the riders not wearing helmet. When a person met with an accident, immediate first aid treatment should be provided. Currently, we are not in a position to ensure the quick treatment. Due to this late medication the person may die. The ultimate aim of the proposed system is to ensure the preventive measures and provide immediate first aid treatment by sending an alert message to the registered mobile numbers which speed up the first aid treatment.

KEYWORDS: accident detection, accident prevention, GPS, GSM, road safety, alcohol detection

I. INTRODUCTION

The bike accidents are rapidly increasing day-by-day which leads to the loss of numerous lives.
As per the report given by the health department of ONEISS (Online National Electronic Injury Surveillance System), that 90% of the bike riders died in accidents were not wearing helmet at that time of accident. More number of accident cases end up with death because of the delayed emergency reporting. The major reason for death due to bike accidents are because of alcohol consumption while driving and not wearing helmet. So here comes the usage of this system which prevents the accident and also report soon .By avoiding liquor drinking while driving may decrease the probability of bike accidents. Millions of people are losing their valuable lives in road accidents. To reduce the death rate in bike accidents, there are two important criteria verified by this system it is discovered before the bike is started. First, it checks whether the rider is wearing a helmet and not just simply keeping it by using the IR sensor. Then, it checks whether the user consumed alcohol or not by using the gas sensor. No alcohol substance should be present in the rider's breath. These two sensors are placed in the rider's helmet. To start the two-wheeler, these two conditions should be verified. As soon as these conditions are verified, the engine of the motor bike starts. If people are doing these two things properly, they may escape from the deaths.

So this system will prevent the death due to accident. Even when the user met with an major accident, this system will report it to the registered phone numbers through SMS. Orelse if the accident is minor and the user is not injured, there is a button in the bike which should be pressed by the person. Then the bike will start automatically.

II. RELATED WORK

In "Internet of vehicle based accident detection and management techniques by using VANET: An empirical study" S.Bhuvaneshwari and R.Saranya reported the impact of synergetic paradigms of VANET envisages sustainable solution for smart transportation. IoV the fastest growing extension module of VANET builds cloud based collaboration among vehicles, humans and internet services[1]. In the proposed system of A.Jessudoss, R.Vybhavi, B.Anusha "Design of smart helmet for accident avoidance" they used PIC microcontroller which needs a separate ADC to convert the sensor values [2].
In "An Automatic accident detection system A hybrid solution ", Ali Hassan, Muhammad Shahroz Abbas, Muhammad Asif, Maaz Bin Ahamad, Muhhamad Zubair Tariq explained that this accident detection system send notification

through SMS with location. The hardware module consists of arduino board with vibration sensor and accelerometer and software module of android applicaton[3]. In the project "A survey on accident detecton and reporting " Justin M. Schietekat, Marthinus.J, Booysen proposed that besides trying to detect accidents, automatically using machine learning and computer vision from surveillance systems[4].

Amrutha Madhusan , Lavanya Viswanathan, Vaishnavi Ravindran, Dr.ShantaRangaswamy, in "A survey on Road Accident Detection and Reporting" Volume 7, Issue 4 proposed the road accident detection and reporting[5]. In the proposed project "An automated system for accident detection" by Asad ali, Mohammed Eid, ASAD is an auto detection unit system that immediately notices an emergency contact through text message and deatilling the location and time of the accident.This involves fuzzy logic as a support to smart phone application that makes sensor under the set of rules[6].

Ms. Rekha. M, Ms. Bharathi. K, Ms. Cynthia, in their project "Drink and Drive Detection System" reported about the drunk and drive detection[7]. In "Accident and alcohol detection in bluetooth enabled smart helmet for bikes" Sayan Tapadar, Shijini Ray, Himadrinath Saha, Arnabkumar used onboard sensors-flex sensors, impact sensors, accelerometer, breath analyser. Breath analyser checks the amount of alcohol in breath an dsends message through online applicaton programming interface[8]. "Smart vehicle using IOT" By P.Brahmendra, S.Prakash proposed a system with sensors passed on framework are used for building the structure.The framework guarantees a reliable and brisk development of data identifying with the episode constantly and updated to cloud which are gotten to by IOT.

III. EXISTING SYSTEM

In the existing system IR sensor checks whether the person is wearing the helmet or not. The Gas sensor or alcohol sensor recognizes the alcoholic substance in the rider's breath, the corresponding sensor's values are monitored by PIC microcontroller. By using the PIC microcontroller, we need a separate ADC to convert the sensor's Analog values into digital values. In another existing system, the data is transmitted through Zigbee. The coverage range of Zigbee is only 10-15 meters. The accident discovery is finished utilizing the accelerometer and the accident warning is finished utilizing the customer and server-based framework where the microcontroller is the customer and the server is an online administration. At the point when an accident happens, the related informations are sent to the person's registered contacts by using a cloud-based administration. The disadvantages of existing system are 1)PIC microcontroller is used which need separate ADC to convert the sensor values 2) Less exactness in the location of accidents and 3) transmitting emergency data through zigbee which has short range coverage of only 10-15 meters.

IV. PROPOSED SYSTEM

The circuit has a accelerometer sensor, alcohol sensor, IR sensor and it sends a signal to the controller to start if the helmet is weared and no alcohol consumption is detected. 3-axis accelerometer senses the crash or hit. After detecting an accident, GPS gets the location and our system sends the accident location automatically to emergency contact number. We implement the project using Arduino uno and the location is tracked by the GPS module. The working of the project is given below. Accident is prevented by checking whether the user is wearing helmet by IR sensor. This sensor is used for touch-less object sensing. An infrared sensor is an electronic device which can emit or detect infrared radiation in order to sense some aspect of its surroundings. Infrared sensors can detect motion. Mostly these type of sensors is used for measuring infrared radiation, rather than emitting it. And alcohol consumption is detected by the alcohol sensor. This gas sensor or alcohol sensor detects the attentiveness of alcohol gas in the air andthis analog output is send to the arduino. This sensor is active when the temperature ranges from -10 to 50° C. The sensing range of this gas sensor is from 0.04 mg/L to 4 mg/L, which is suitably used in breathalysers.

These sensed values from the infrared (IR) sensor and gas sensor is given to the arduino uno which converts the analog signals to digital. If the condition are veriviered with the computer then the bike starts automatically. Now by this accident can be prevented to a maximum level. Then if any accident occurs to the user, it must be repoted as soon as possible to prevent death case. So here comes the usage of this system . Our system senses the vibration occurred during the accident using the accelerometer sensor and gives the output of the sensor to the arduino uno. Then it will send SMS to the registered phone number with exact location of the accident. This is the process of the system. The Block diagram is shown in Fig.1.
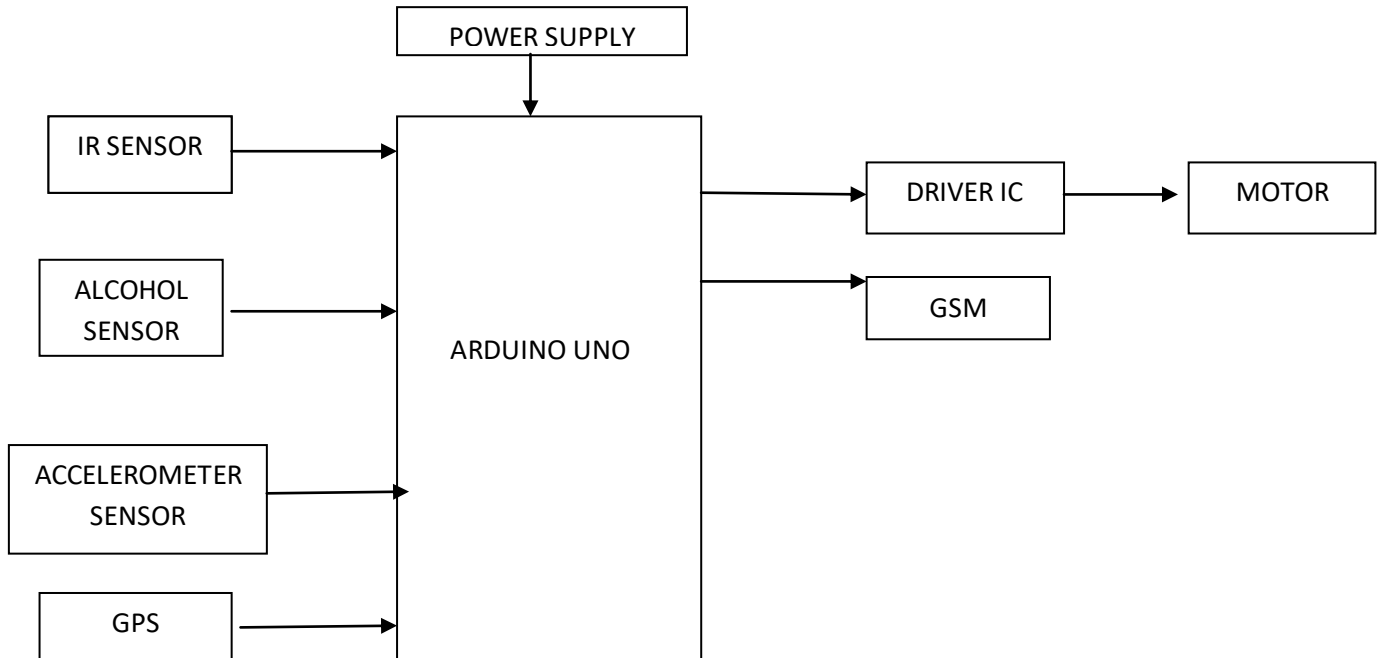
Fig .1. Block diagram

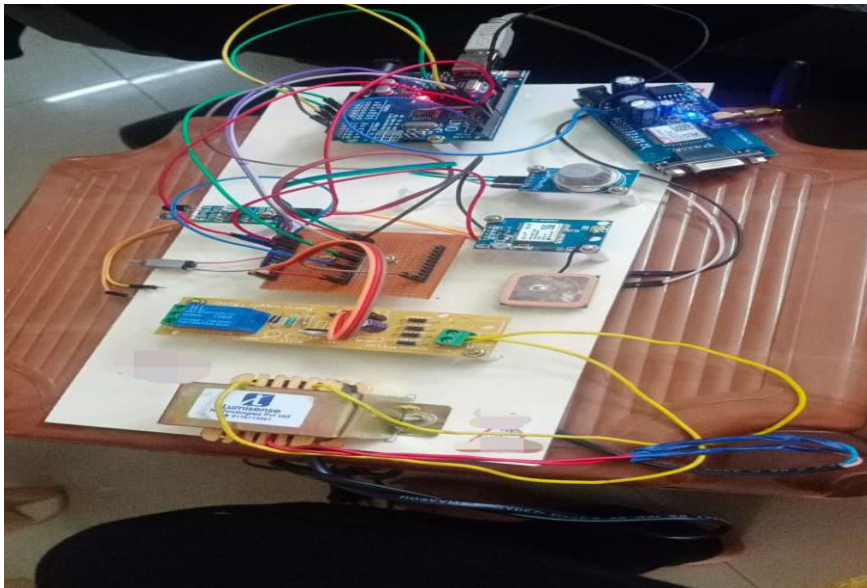## V. RESULT

Fig .2. Simulation Output

Fig.3. Hardware Output

In fig.2. the program is successfully coded and uploaded in arduino uno and Fig.3. is the hardware part of the project. This board is small and compactible which should be placed in the bike which checks the precausive methods such as whether the rider is wearing the helmet or not and also it checks the alcohol consumption level of the person. If the rider is wearing the helmet and didn't consume alcohol only the bike starts.Even accident occurs for the user, it can be immediately reported to the registered mobile numbers. This provides a superfast solution and prevent from major damage or death.

SOFTWARE REQUIREMENTS:
- ✓ Arduino IDE
- ✓ Embedded C
- ✓ PHP

Merits compared to existing system:
- ✓ Vehicle accidents detection is achieved automatically.
- ✓ Exact location is shared with the emergency contact number.
- ✓ Compact size system providing 100% accuracy.

VI. APPLICATIONS

- ✓ It can be used in real time safety system.
- ✓ We can implement the whole circuit into small module later.
- ✓ Less power consuming safety system.
- ✓ This safety system technology can further be enhanced into four wheeler also by replacing the   helmet with seat belt.

VII. FUTURE SCOPE

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.

VIII. CONCLUSION

There may be many accident preventing and avoiding system. But our proposed system provides maximum accuracy and work exactly. This system will be used widely to reduce the death cases minimum due to accident. So accidents in today's world shows the importance of this proposed system.

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