Smart System for Safe Drive

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ABSTRACT

In modern developing world , automobile plays important role especially two-wheeler. The main reasons for motorbike accidents are due to not wearing helmet, not lifting the side stand and alcohol intake. So we have proposed a project which enables the rider to start the bike only after checking above mentioned conditions were satisfied. Hence our project may help to reduce the accidents. Our Project is based on Arduino Uno, 1Sheeld and a Smartphone. The motorcycles and bikes concerned accidents occur due to riding the bikes with high speed. The major accidents occur due to forgetting to lift the side stand, because all the other source of accidents has preventive measure, but accidents due to side stand do not have proper preventive measure

Keywords: Arduino Uno, 1Sheeld, Smartphone.

1. INTRODUCTION

Automobiles are having important role as it reduces human effort and time mostly bikes. Even if they are helpful there are some sad events like accidents due to careless of rider. Most of accidents occur due to forgetting to lift side stand. To overcome this problem many advance measure have taken, but they are useless. The best advice is not to drink alcohol if you intend to ride motorcycle. Alcohol consumption affects reaction times, causes disinhibition and also an ability to properly manage, steer and control a bicycle. Research conducted revealed that intoxicated cyclists appear to be 10 times more at risk of injury than sober cyclists. New studies show that that more than 80mg of alcohol in every 100 millilitres of your blood is likely to impair your ability to ride safely. According to the study, bike riders who are consistent in wearing their helmets are twenty-two percent lesser prone to be victimized with cervical spine injury and wearing a helmet will prevent them from experiencing more fatal injuries. Head injuries are the most widespread cause of death in motorcycle accidents.
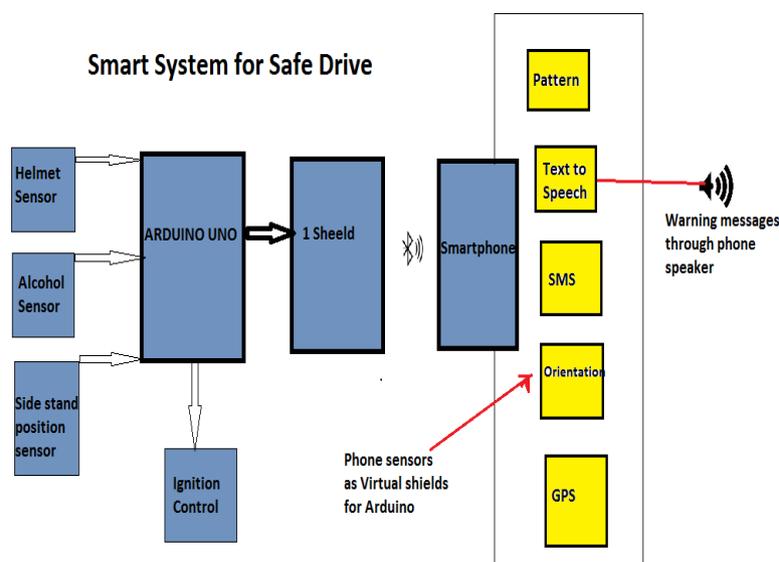

Fig 1: Proposed System Block Diagram

2. PROPOSED SYSTEM

This proposed system uses a "Smart System for Safe Drive" and the project is based on Arduino Uno and 1Sheeld and a Smart phone,

The pattern, Text to speech, SMS, Orientation and GPS are mobile apps which act as virtual shields to Arduino through 1Sheeld interface board.

Whenever a person likes a ride on a bike and turns ON the ignition key, the system checks whether the rider enters the correct pattern on the smart phone screen and if it does not match ,the Text to speech shield gives out the following audio message through phone speaker ;

"Pattern wrong, Please try once again "

Then the system checks whether the rider has a helmet on his/her head; if not this message is played,

"Please wear your helmet"

The system then checks whether the rider has lifted the bike's side stand, if not the following message is played,

"Please lift the side stand"

Then system checks whether the rider is under influence of alcohol, if it is the following message is played,

"You have consumed alcohol, you are not allowed to ride "

If all the conditions are satisfied, the system enables the ignition switch.

During the ride the rider is required to have his/her Smartphone in the shirt pocket or hand bag.

In case the rider is met with an accident and falls on the road, the orientation shield detects the change in the orientation and the system sends a SOS message to a preloaded cell number along with GPS coordinates acquired from the GPS shield.

3. COMPONENTS

1. Arduino Uno
2. 1Sheeld
3. Alcohol Sensor
4. Smartphone

3.1. ARDUINO UNO

Arduino is an open-source platform used for building electronics projects. Arduino consists of both a physical programmable circuit board (often referred to as a microcontroller) and a piece of software, or IDE (Integrated Development Environment) that runs on your computer, used to write and upload computer code to the physical board.

Unlike most previous programmable circuit boards, the Arduino does not need a separate piece of hardware (called a programmer) in order to load new code onto the board – you can simply use a USB cable. Additionally, the Arduino IDE uses a simplified version of C++, making it easier to learn to program.

Fig 2: Arduino Uno

3.2. 1SHEELD

1Sheeld consists of two parts Physical Board: With a microcontroller and a Bluetooth module to transmit data between Arduino and the Smartphone.

Fig 3: 1Sheeld

3.3. MOBILE APP & PLATFORM

Opens your phone's sensors and capabilities to be used as virtual shields for Arduino.1Sheeld can be stacked on top of Arduino board, and the code is written using 1Sheeld library. 1Sheeld board can be paired with 1Sheeld app over Bluetooth and s the shields from a list of over 40 shields can be selected. 1Sheeld+ uses a standard HM-10 Bluetooth low energy adapter (BLE 4.0) and range up to 30 feet, Communicates with Arduino using UART.

Fig 4: 1Sheeld mobile app

3.4. Alcohol Sensor

Alcohol sensor is suitable for detecting alcohol concentration on your breath, just like your common breath analyzer. It has a high sensitivity and fast response time. Sensor provides an analog resistive output based on alcohol concentration

Fig 5: Alcohol Sensor

4. CONCLUSION

This project efficiently checks the wearing of helmet, drunken driving , side stand position and alert system with SMS to the user defined mobile numbers. The proposed smart system for safe drive can track geographical information automatically and sends an alert SMS regarding accident. By implementing this system a safe 2 wheeler journey is possible which would decrease the accident rate. This made the project more user-friendly and reliable.

REFERENCES

[1] Gururaj G. Road traffic injury prevention in India. Bangalore: National Institute of Mental Health and Neuro Sciences, 2006.

[2] Abid Khan, Ravi Mishra "GPS – GSM Based Tracking System" International Journal of Engineering Trends and Technology, Volume3, Issue2, Pp: 161-169, 2012.

[3] NiravThakor, TanmayVyas, Divyang Shah "Automatic Vehicle Accident Detection System Based on ARM &GPS", International Journal for Research in Technological Studies, Vol-1, Issue - 1, pp :17-19, Dec 2013

[4] S.Sonika, Dr.K.Sathiyasekar, S.Jaishree "Intelligent accident identification system using GPS, GSM modem", International Journal of Advanced Research in Computer and Communication Engineering Vol. 3, Issue-2, Feb 2014.

[5] C.Prabha, R.Sunitha, R.Anitha "Automatic Vehicle Accident Detection and Messaging System Using GSM and GPS Modem", IJAREEIE, Vol. 3, Issue 7, pp: 10729 – 10727, July 2014.

[6] C.Prabha, R.Sunitha, R.Anitha "Automatic Vehicle Accident Detection and Messaging System Using GSM and GPS Modem", IJAREEIE, Vol. 3, Issue 7, pp: 10723 – 10727, July 2014.