IOSR Journal of Engineering (IOSR JEN) **www.iosrjen.org**
ISSN (e): 2250-3021, ISSN (p): 2278-8719
PP 31-34

Perceptive Moto Head Protector Using Arduino

Divya Swamy, Varsha Trimukhe, Ajeet Godeshwar
(Computer Engineering, Atharva College of Engineering/Mumbau University, India)
(Computer Engineering, Atharva College of Engineering/Mumbau University, India)
(Assistant Professor, Computer Engineering, Atharva College of Engineering/Mumbau University, India)

Abstract: *In this paper we have discussed how to build a safety system which is integrated with the smart helmet and intelligent bike to reduce the probability of two-wheeler accidents and drunk drive cases. It is such that the programmed microcontroller 8051 indicates whether the rider is wearing the helmet with the help of two IR sensors, the alcohol sensor MQ-3 is used to check the alcohol consumption level and piezo plates are inserted in the inner region of the helmet. [3] If an accident occurs then the piezo plates are hit and triggered and sends message to the microcontroller which sends data to the GSM and GPS module about the accident and the location where accident has occurred. [10]*

Keywords– IOT, Arduino, IR sensor Servomotor, Piezo plates, Alcohol sensor MQ-3, GSM and GPS module

I. Introduction

Today we all talk about Internet of Things and how it is changing our lives. The Internet of Things is creating a new world, a quantifiable and measurable world where people and businesses can manage their activities in better informed ways, and can make more easy and informed decisions about what they want to do or need to do. This smart world brings in many practical improvisations such as convenience, health and safety in everyone's lives. The effect when a motorcyclist involves in a high speed accident without wearing a helmet is dangerous and can cause fatality. [2] Wearing a helmet can reduce shock from the effects and may save many lifes. There are many countries that have their regulation that requires the motorcycle's rider to wear a helmet when riding on their motorcycle. The main objective of this project is to design an intelligent system which will prevent a drunk person from driving which leads to accidents. This system provides security and safety to the bikers against road accidents. [8]

II. Literature Survey

1) Dangeti Anu Preetham, Mukundala Sai Rohit, in their paper "Safety helmet with alcohol detection and theft control for bikers" proposed that the Programmed microcontroller 8051 indicates whether the rider is wearing the helmet with the help of two IR sensors, the alcohol sensor MQ-3 which is used to check the alcohol consumption level and the ARM 7 board, which is integrated with the PC using COM port1. A face detection algorithm called Viola-Jones coupled with SVM (support vector machines) for classification is used to track down faces for additional safety and security for the bike rider. [1]

2) Prof. Chitte P., Mr.Salunke Akshay S, in their paper "Smart Helmet & Intelligent Bike System" proposed to make a protection system in a Helmet for a good safety of bike rider. The helmet gear is fixed with sensors Force Sensing Resistor (FSR) which act as to detect a helmet is worn or not. There are two different microcontrollers that is used in this project. Each unit has used a separate microcontroller, for bike unit. Arduino Lily pad is used and for helmet unit ARM7 lpc2148 is used. The Signal transmission between helmet unit and bike unit is done using a RF concept. [5]

3) Bharavi U, Sukesh Rao.M I their paper "Design and Development of GSM and GPS Tracking Module". The GSM and GPS module is designed and developed using SIM808. Schematics for all parts of module are designed. PCB layout of module is designed. After module is developed parts of module like regulator, Serial Interface, SIM card Interface and Antenna interface are tested and verified that they are working properly. GSM and GPS module is interfaced with PC through serial port. Module is tested by sending AT commands from PC and checking its response to them. GSM features ofmodule are tested by inserting SIM card. Module can be used to make and receive calls. SMSs are sent from the module. [10]

4) Sayan Tapadar, in the paper "Accident and alcohol detection in blue tooth enabled smart helmets for motorbikes". The proposed system is based on Bluetooth enabled helmets using accelerometer (ADXL355) and breath-analyzer (MQ3), onboard sensors - flex sensor, impact sensor. The core of the device, is a cheap and easily available and programmable Arduino NANO clone, with at mega 328. It provides limited processing capability. It is small, and compact, which is an important factor because the entire hardware needs to be fitted inside a helmet. [9]

5) John, A., & Nishanth, P.R, in their paper, "Real time embedded system for accident prevention" proposed that whenever a person sits in driver seat of a vehicle, the system checks for following parameters with the driver. The alcohol sensor - checks if the person has consumed alcohol or not.MQ3 sensor is suitable for detecting alcohol concentration from driver's breath. If a drunk driver tries to sit on a driver seat, then the alcohol sensor MQ3 detects the presence of alcohol and blows the buzzer and unless the alcoholic person is replaced by a normal person, the vehicle wouldn't ignite .The eye sensor ensures that the person in driver seat does not fall asleep. [4]
6) Sudharsana Vijayan1, Vineed T Govind2 Merin Mathews3 "Alcohol detection using smart helmet system" proposed that if the person is not wearing his helmet and he is drunk then the data to be transferred is coded with RF encoder and transmitted through radio frequency transmitter. The receiver at the bike receives the data and decodes it through RF decoder. [3]
7) Mohd Khairul Afiq Mohd Rasli, Nina Korlina Madzhi, Juliana Johari "Smart helmet with sensors for accident prevention" proposed that A Force Sensing Resistor (FSR) and BLDC Fan are used for detection of the rider's head and detection of motorcycle's speed respectively. A 315 MHz Radio Frequency Module as wireless link which able to communicate between transmitter circuit and receiver circuit. PIC16F84a is a microcontroller to control the entire component in the system. Only when the rider buckled the helmet then only the motorcycle' s engine will start. A LED will flash if the motor speed exceeds 100 km/hour. [8]
8) Rashmi Vashisth, Sanchit Gupta, Aditya Jain, Sarthak Gupta, Sahil, Prashant Rana "Implementation and analysis of smart helmet" proposed to make a system in which two modules one on the helmet and bike each will work in synchronization, to ensure that the biker is wearing the helmet. A radio frequency module is responsible for the wireless communication between the helmet and the bike circuit. The Piezo electric buzzer is used to detect speeding and this feature is extended by limiting the speed of the user. The ALCHO-LOCK function is used to prevent drink and drive scenarios. [14]
9) Sreenithy Chandran; Sneha Chandrasekhar; N Edna Elizabeth "An Internet of Things (IoT) based smart helmet for accident detection and notification" The objective of this paper is to provide a means and apparatus for detecting and reporting accidents. Sensors, Wi-Fi enabled processor, and cloud computing infrastructures are utilised for building the system. The accident detection system communicates the accelerometer values to the processor whichcontinuously monitors for erratic variations. When an accident occurs, the related details are sent to the emergency contacts by utilizing a cloud based service. [7]

III. Problem with Existing system

In the existing smart helmet there are lot of components used only for detection of wearing the helmet and consumption of alcohol. This increases the weight of the helmet and hence makes it difficult for the rider to wear it. Also the sensors and other components inserted inside the helmet makes it uncomfortable for the rider to wear it as wearing it for a lot time results in too much of sweating which leads to skin rashes. Cloud computing infrastructures are utilised for building the system for accident detection will is too expensive and difficult to maintain. [9]

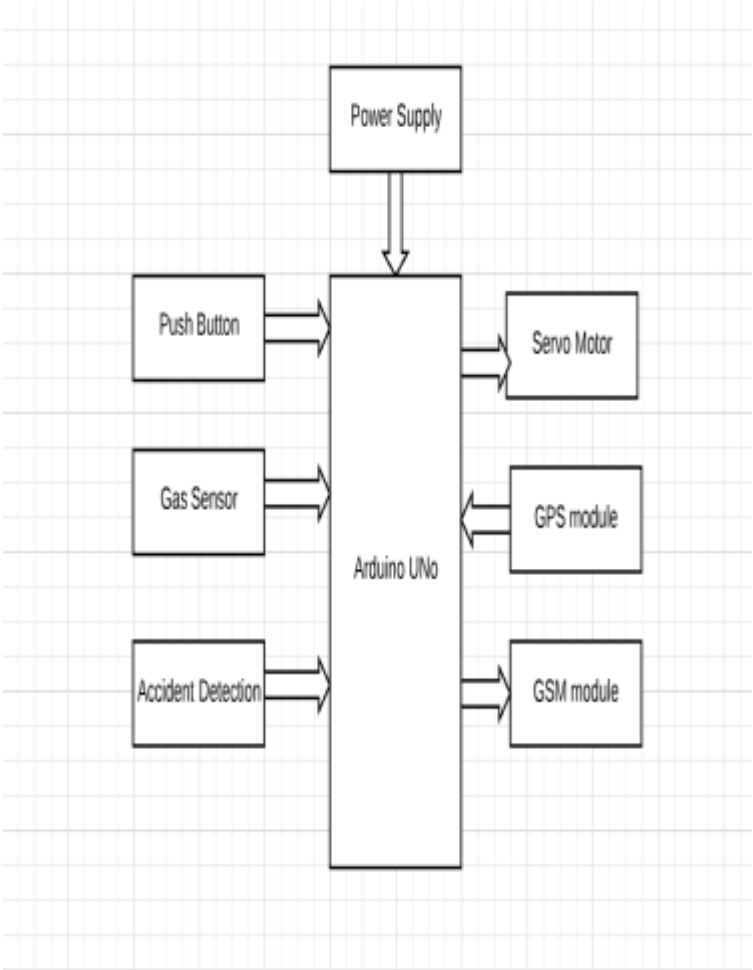
IV. Proposed System

The proposed Perceptive Moto Head Detector using Arduino and Piezo Plates has three main modules which are as follows:-
1. Helmet Detection System
2. Alcohol Detection System
3. GSM and GPS Module

1. Helmet Detection System: The Rider can start the bike only if he wears the helmet that is the IR sensors are placed in the Helmet which detects the head motion and then sends the signal to the Servo Motor after which the bike will start.

2. Alcohol Detection System: The alcohol sensor MQ-3 will be placed in the chin region of the helmet so when the rider wears his helmet the alcohol sensors placed in the chin region will check if the rider is sober and if condition is satisfied then only if will be able to start his bike.

3. GSM and GPS Module: The piezo plates inserted in the head region will be hit and triggered if an accident occurs and the message about the accident and location of the accident will be send to the registered mobile number.



Moto Head Protector Block Diagram

The project will be definitely useful for the safety of the bike riders and the system of the proposed project. The project will be cost efficient as it will only need the helmet with IR sensors, alcohol sensor and piezo plates inserted inside the helmet. The alcohol detection and engine locking system will help in reducing road accident cases which is ultimately going to help the peoples and traffic safety systems. System will also help in reducing criminal offense among the drivers and system is totally automated. System will also ensure safety of vehicle to vehicle owner as well as family members of driver. This can be used in the bike system which is smart and safe for the riders and also the passengers.

V. Conclusion

Thus the Perceptive Moto head protector System will work on the proposed system and will detect the head motion of the rider and then if the condition is satisfied the vehicle will start. It will also detect the presence of alcohol and if this condition is satisfied then only the vehicle will start. The GSM and GPS module will notify the family members about the collision of the vehicles occurred during the accident and send the approximate geographic location with the help of GPS.

References

[1]. Dangeti Anu Preetham, Mukundala Sai Rohit. "Safety helmet with alcohol detection and theft control for bikers". 2017 International Conference on Intelligent Sustainable Systems (ICISS)
[2]. K Venkata Rao1, Shivani D Moray2, Shraddha SR3, Vandana4, Varsha K5" IOT BASED SMART HELMET FOR ACCIDENT DETECTION" (IJTRA) 2018
[3]. Sudharsana Vijayan1, Vineed T Govind2 Merin Mathews3 "Alcohol detection using smart helmet system". International Journal of Emerging Technology in Computer Science & Electronics (IJETCSE), 2015
[4]. JohnA., &Nishanth,P.R. "Real time embedded system foraccident prevention" ICECA2017
[5]. Prof. Chitte P.P, Mr.Salunke Akshay.S "Smart Helmet & Intelligent Bike System". International Research Journal of Engineering and Technology (IRJET) May-2016
[6]. Akash Pandey, Mansi Jane, Abhishek Markande, Kalyani shingane , Lochana Yelekar, Sayali Haridas Kakade6, Prof. Shelke7 "Review on Smart Helmet" IRJET 2018

[7]. Sreenithy Chandran, Sneha Chandrasekar, N Edna Elizabeth "An Internet of Things (IoT) based smart helmet for accident detection and notification" IEEE2016
[8]. Mohd Khairul Afiq Mohd Rasli, Nina Korlina Madzhi, Juliana Johari "Smart helmet with sensors for accident prevention" IEEE 2014
[9]. SayanTapadar Department of Computer Science andEngineering "Accident and alcohol detection in Bluetoothenabled smart helmets for motorbikes sign" In or Purchase,IEEE 2018
[10]. BharaviU, Sukesh Rao.M, "Design and Development ofGSM and GPS Tracking Module", 2017 2nd IEEEInternational Conference on Recent Trends in ElectronicsInformation & Communication Technology (RTEICT)
[11]. Mr.Sethuram rao1, Vishnupriya.S.2,Mirnalini.Y3 , Padmapriya.R.S4"THE HIGH SECURITY SMART HELMET USINGINTERNET OF THINGS"(IJPAM)2018
[12]. Albert Daimary, Meghna Goswami,Ratul Kumar Baruah "A low powerintelligent helmet system" IEEE 2018
[13]. Nitin Agarwal1, Anshul KumarSingh2, Pushpendra Pratap Singh3,Rajesh Sahani4' "Smart Helmet" (IRJET)2015
[14]. Rashmi Vashisth, Sanchit Gupta, Aditya Jain, SarthakGupta, Sahil, Prashant Rana "Implementation andanalysis of smart helmet" IEEE 2017.
[15]. Indranil Nikose1,TusharRaut1,ReenaBisen1, Varsha Deshmukh1, AshwiniDamahe1, Pranoti Ghotekar1." ReviewPaper on Smart Helmet using GSM andGPS Technology" IJARCCE 2017