

Smart Safety Helmet

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Abstract : Smart Safety Helmet for Motorcyclist is a project undertaken to increase the rate of road safety among motorcyclists. The idea is obtained after knowing that there is increased number of fatal road accidents over the years. Through the study identified, it is analyzed that the helmets used is not in safety features such as not wearing a helmet string and not use the appropriate size. Therefore, this project is designed to introduce safety systems for the motorcyclist to wear the helmet properly. The motorcycle can move if there is helmet pound wearing, in accordance with the project title "Smart Safety Helmet" for motorcyclist using Arudino. Safety system applied in this project meet the characteristics of a perfect rider and the application should be highlighted. The project is expected to improve safety and reduce accidents, especially fatal to the motorcyclist. A motorcycle's helmet is a type of protective headgear used by the motorcyclist. The main purpose is for safety, which is to protect the rider's head from the impact during an accident. It protects the rider's head as the helmet provides ventilation system. The Smart Helmet having built-in Bluetooth capabilities and controls, enabling users to use all features of organization communication devices without any pre-requirement of installing a headset. Speeding and not wearing a helmet are the main reasons of fatalities and injuries. Here we are implementing a model which uses Arudino UNO, Relay, Alcohol and Pressure sensor which in real time system is related to the ignition system of the Motorcycle.

Index Terms - Internet of Things (IOT), Smart Safety Helmet.

I. INTRODUCTION

In this competitive world one of the surveys says that the death tolls due to motor-bike accidents are increasing day-by-day out of which most of these casualties occur because of the absence of helmet. Traffic police cannot cover remote roads of the city. That's why our primary target is to make the usage of the helmet for two-wheelers "compulsory". Some mental states, stress or sleepiness are known to increase the potential of accidents on roads, therefore could decrease productivity and increase the cost of healthcare if the potential accident occurs. The highest rate of accidents have increased due to over speed limit, alcohol consumption and over taking.

The guiding objective of this research project is to develop a device which is able to recognize abnormal behaviors of people which endanger safety and also to human health. The SSH includes mechanical components, electronic hardware for sensing human behaviors, a wire transmission to communicate with the machine tool.

It is known that head gestures and brain activity can reflect some human behaviors related to a risk of accidents when using machine tools. The research presented in this project is to reduce the risk of injury and thus increase the human safety. In this project presented the Smart Safety Helmet [SSH] in order to track the head gestures and the brain activity of the human to recognize the human behaviors and also reduces injuries in the accidents.

II. LITERATURE SURVEY

The sense of moral responsibility towards the society laid the foundation of our project named as "Smart Safety Helmet." The thought of developing this paper comes from social responsibility of all citizens towards the society. As we can see many accidents occurring around the roads there is a lot of loss of life. According to a survey, around "1000" people die in road accidents occurring due to bike crashes , overtaking etc per year. The reasons for the accidents may be many such as no proper driving knowledge, damaged bikes, rash driving, drink and drive cases etc.[1]

Safety and Head motion recognition; IMU; EEG; accident avoidance; human machine interaction etc. It is known that head gesture and brain activity can reflect some human behaviors related to a risk of accident when using machine tools. The research presented in this paper aims at reducing the risk of injuries and thus increase people safety.[2]

PIC Microcontroller, Arduino-Nano , Radio Transceiver is NRF24L01, Ultrasonic sensor named HCSR04, Speech synthesizer-easy VR, Arduino IDE software. The prime objective of this paper is to force the helmet throughout while driving on roads. Considering the increasing no. of motor cycle riders in our country and the no. of accidents happening per year.[3]

III. PROPOSED SYSTEM

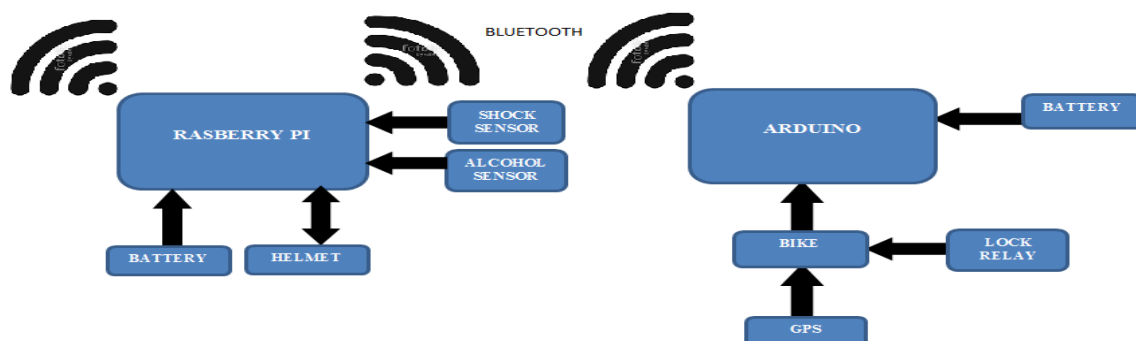


Fig :Block Diagram

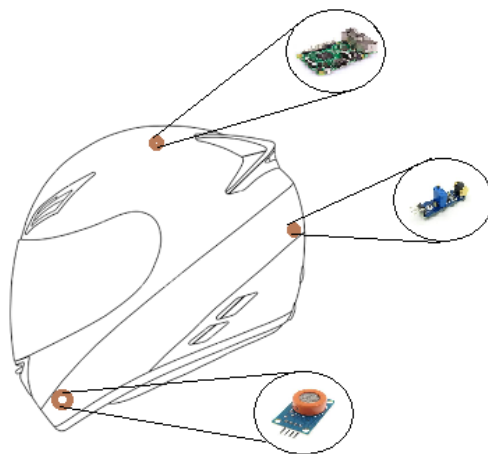


Fig: Helmet connections

This project is developed to save the life of humans from accidents and to send the information about the person who is wearing the helmet to the contact person using the Raspberry pi as master mood and the Arduino as slave mood. The project consists of sensors like the shock sensor, alcohol sensor. Arduino works as a slave mood. It is given supply using the 5V batteries. GPS (Global Positioning System) and lock relay are connected to Arduino and whole this is implemented on the bike. GPS gives the information about the navigation of the person. It is of 13 bytes. Byte 3 and 4 is used for latitude and longitude respectively. Lock relay is used to start the bike ignition system. This information is sends to master mood i.e. Raspberry pi. This total implementation leads to the safety of the system.

RELAY

Relays are the switches that are normally opened and normally closed contacts . Relays control one electrical circuit by opening and closing contact and contacts in the another circuits. Relays are generally used to switch smaller current in control circuit and do not usually control power consuming devices except for small motors and solenoids that draw low amperes . There are some magnetic latching relays which can be single or dual coils. Relays are used to control the circuit by a separate low power signals .

GPS



Fig: GPS

People have used a variety of techniques to navigate across the world. The GPS project was first started in 1973 and became fully operational in the year 1994. The system is made by the United States Department of Defence and was originally intended for many military applications, but was also made available for the public use on completion. The GPS system consists of a network of 20 active satellites and 7 spares which are located nearly 21,000 km above the earth's surface. Each satellite broadcasts different signals which can be tracked by a GPS receiver on the Earth, which are then analyzed by the GPS receiver to determine its exact locations. The signals operate in all weather conditions. Our project's GPS information is stored on the cloud server to track our locations to know were the rider is present at that situation.

IV. IMPLEMENTATION AND WORKING

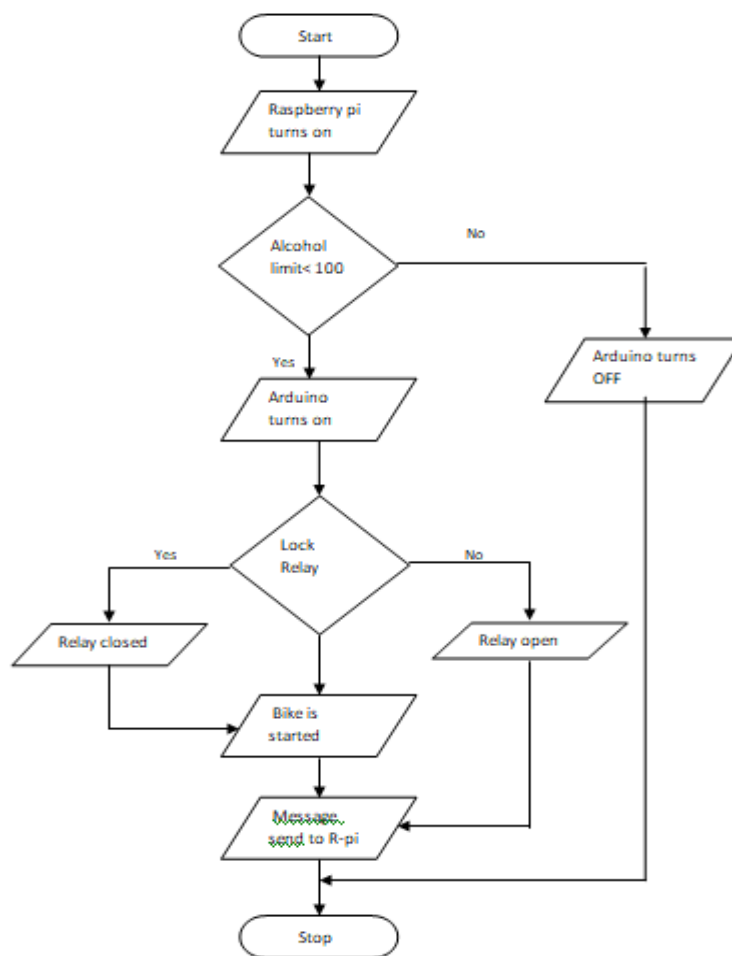


Fig: Flowchart

This project is implemented for safety purposes. The steps are as follows:

- Step 1 : Wear the helmet on the head.
- Step 2 : Raspberry pi turns ON.
- Step 3 : Alcohol sensor limit is detected .
- Step 4 : If alcohol limit is < 100, Arduino turns ON or else it is OFF .
- Step 5 : Once Arduino is ON , lock relay is closed then bike gets started and the message is send to the Raspberry pi.
- Step 6 : When Arduino is OFF , lock relay is opened and bike gets stopped.

ADVANTAGES

1. Detection of accident in remote area can be easily detected.
2. Simply avoiding the drink and drive by using alcohol detection.
3. Safe and slow driving on roads.
4. Messages are received by the contact persons .
5. Safety monitoring of the environment.

DISADVANTAGES

1. If helmet is stolen, the bike won't start.
2. Usage of relay leads to consume more power.
3. Point to Point communication is required.

V. CONCLUSION

This project is very useful in day to day life and adds extra safety while riding the bike. It is like a virtual traffic police inspector, that are the sensors checking time to time if the helmet is still on or not. The main advantage of this project is that you don't have to pay fine in latter case. Use of this project makes ones bike secure at crucial times, especially when one is away from the bike and someone is trying to steal it or in other words if there are any chances of theft that can occur. It leads to the safety of human life.

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