PROJECT TITLE: **Smart Helmet**

ABSTRACT

According to the investigation in India, nearly 25% of the road accidents are caused by two wheelers. The foremost causes for the fatalities are due to drunken driving, rash driving, and drowsiness due to long drive. The aim is to build an interesting smart helmet that protects us from accidents and indicates the accident-prone area. Here we are using various sensors to build the smart helmet. To detect alcohol consumption of the rider we use Alcohol sensors. In order to check a rider's helmet, an infrared sensor can be used. Vibration detector is also added to the helmet to indicate the harsh hitting of the helmet during an accident. When the two wheelers slide down due to road rashes, the GPS is used to identify the location of the accident spot and quickly sends messages (location) to police stations and hospitals nearby through GSM.

PROBLEM STATEMENT

The Smart helmet has two modules of operation i.e. one receiver part and one is transmitter part. The transmitter part is embedded in the helmet itself whereas receiver part can be installed in any particular bike. Thus, wireless communication takes place between two modules.

In the transmitter module, pressure signal is sensed by pressure transducer which is situated inside the helmet. A comparator converts ana log signal to digital signal and feeds as logic level 1 to the input of transmitter whereas transducer gives the output. When the user takes off the helmet then the output of transducer becomes zero and the input of the transmitter will get 0 as logic level. Also, MQ -3 gas detector (alcohol sensor) is used to detect the alcohol content from the breath of the rider. It can be placed just below the face defend so that it can sense it easily. If the rider is drunk, then the resistance value drops which leads

to the sudden change in voltage value. Then this value transfers to the microcontroller and it prevents from the ignition of the bike under this case.

In the receiver module, a high level digital output will obtained by the output pin till the rider wears the helmet and the ignition unit circuit of the bike will be completed when this signal actuates the digital relay. When the rider takes off the helmet the relay opens and the connections of the circuit will get terminated. If someone unfortunately meets with an accident then it will be detected by vibration sensor and the location of that particular place will be send to his relatives as well as to nearby police station in the form of longitude and latitude values via GSM and GPS module.

PROJECT FRAMEWORK = ARDUINO IDE

Hardware used:

SL NO	NAME	SPECIFICATION
1	GSM	SIM 800
2	GPS	NEO 6M 0001
3	MOTOR DRIVER	L293D
4	VIBRATION SENSOR	------
5	ALCOHOL SENSOR	MQ-3
6	ARDUINO BOARD	--------

Hardware requirement specification:

Operating System: Windows 10/Windows 11

Hard disk: Minimum 40 GB

RAM: Minimum 512 MB

Processor – Minimum Pentium Dual Xenon Processor

1.MODULES USED:

Project modules:

1) STATUS OF RIDER WEARING HELMET:

If the rider wears the helmet and press the switch, only then the motor will start Without wearing the helmet, the motor will fail to start.

2) ALCOHOL CONTENT TEST:

Illegal consumption of alcohol at the time of driving is 0.08mg/L as per govt act. But for demonstration purpose it is programmed to the threshold limit 0.04 mg/L.

If the sensitivity of MQ-3 is more than 0.04mg/L in breath then the driver can't drive the bike.

3) ACCIDENT DETECTION:

A range of frequency generated depending upon vibration produced due to accident or obstacle. If frequency is greater than the threshold value then the vehicle unit shows accident detected.

4) ACCIDENT LOCATION:

Once, vehicle unit shows “Accident Detected” then GSM sends the location of accident with the help of GPS. It sends latitude and longitude continuously to saved sim numbers till ignition system is turned OFF.

key features:

1 Rider’s safety

2 Alcohol detection

3 Accident detection

Bibliography –

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