# SMART HELMET

# PROJECT REPORT

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# ABSTRACT

In India still most of the people prefer two wheelers compared to other form of vehicle due to simplicity and its low cost. One important problem is bike riders suffer from inadequate roads and bad driving conditions. Other important problem with bikers is that most of the time they don't like to wear helmet which could be fatal when accidents happen. Two wheelers in everyone's life play vital role, moreover the safety is considered to be primary of all. According to some statistics 50% of accident occurs due to bad conditions of road and not wearing helmet. To avoid accidents and to encourage people to wear helmet a project is to be introduced that includes alcohol detection and over speed detection. Helmet communicate with rider if he is not wearing it and prevents starting, if the rider is not wearing it or consumed alcohol. It will also turn of the engine, if the speed increases more than 60km/hr. Since in India the usage of two wheelers is more compared to four wheelers, it requires more attention as far as safety is concerned.

# INTRODUCTION

## MOTIVATION

Security and safety is one of the most talked of topics in almost every aspects. Previously the most compulsion is to wear the helmet for the bike riders .In recent times helmets have been made compulsory in India. Traffic accidents in India have increased year by year. As per Section129 of Motor Vehicles Act, 1988 makes it required for every single riding a two-wheeler to wear protective headgear following to standards of the BIS (Bureau of Indian Standards).In India drunken drive case is a criminal offence of The Motor Vehicle act 1939. Which states that the bike rider will get punish. In existence bike rider easily get escaped from law. These are the three main issues which motivates us for developing this project. Nowadays almost most of the countries are forcing the motor riders to wear the helmet and not to use the vehicles when the person is in drunken condition. But still in many places, the rules are being violated by the users. In order to overcome this problem, an intelligent system has been embedded in the helmet itself

People prefer motorcycles over car as it is much cheaper to run, easier to repair, easier to park and flexible in traffic. In India more than 37 million people are using two wheelers. Since usage is high accident percentage of two wheelers are also high compared to four wheelers. Motorcycles have high rate of fatal accidents than automobiles or trucks and buses. Nearly 600 people lost their lives in road accidents last year. One third of all those who died in road accidents could have survived had they worn a helmet. Studies shows that usage of helmet can save accident death by 30 to 40 percent. The rate at which number of two wheelers in India is rising is 20 times the rate at which human population is growing. In such scenario fatalities are only going to raiseif things do not change fast. The risk of death is 2.5 times more among riders not wearing a helmet compared with those wearing a helmet. These are the main issues which motivates us for developing this project.

## OBJECTIVE OF THE PROJECT

The aim of this project is to make a protection system in a helmet for a good safety of bike rider. The smart helmet that we made is fixed with sensors which act as to detect wear helmet or not. There are different microcontroller is used in this project. Each unit has used a separate microcontroller, for helmet unit we use ATMEGA 16. Signal transmission between the helmet unit and bike unit is using a RF concept.

The first step is to identify the helmet is wear or not. If helmet is wear then ignition will start otherwise it will remains off till helmet is not wear. The second step is alcohol detection. Alcohol sensor is use as breath analyser which detect the presence of alcohol in rider breathe if it is exceeds permissible range ignition cannot start. The third step is to limit the speed, if speed crosses the particular limit buzzer gets on. The thought of developing this project comes to do some good things towards the society. Day by day the two wheeler accidents are increasing and leads to loss of many lives. Accord to a survey of India there are around 698 accidents occurring due to bike crashes per year. The reasons may be many such as no proper driving knowledge, no fitness of the bike, fast riding of bike, drunken and drive etc. Sometime the person injured, the accident may not be directly responsible for the accident, it may be fault of rider, but end of the day it's both the drivers involved in the accidents who is going to suffer. If accidents are one issue, lack of treatment in proper time is another reason for deaths. According to the survey India 698 accidents occur per year, nearly half the injured people die due to lack of treatment in proper time.

Considering three major factors for avoiding the accident causes such as

I. Make wearing the helmet compulsory.

II. . Avoid drunk and drive.

III. Over speed detection.

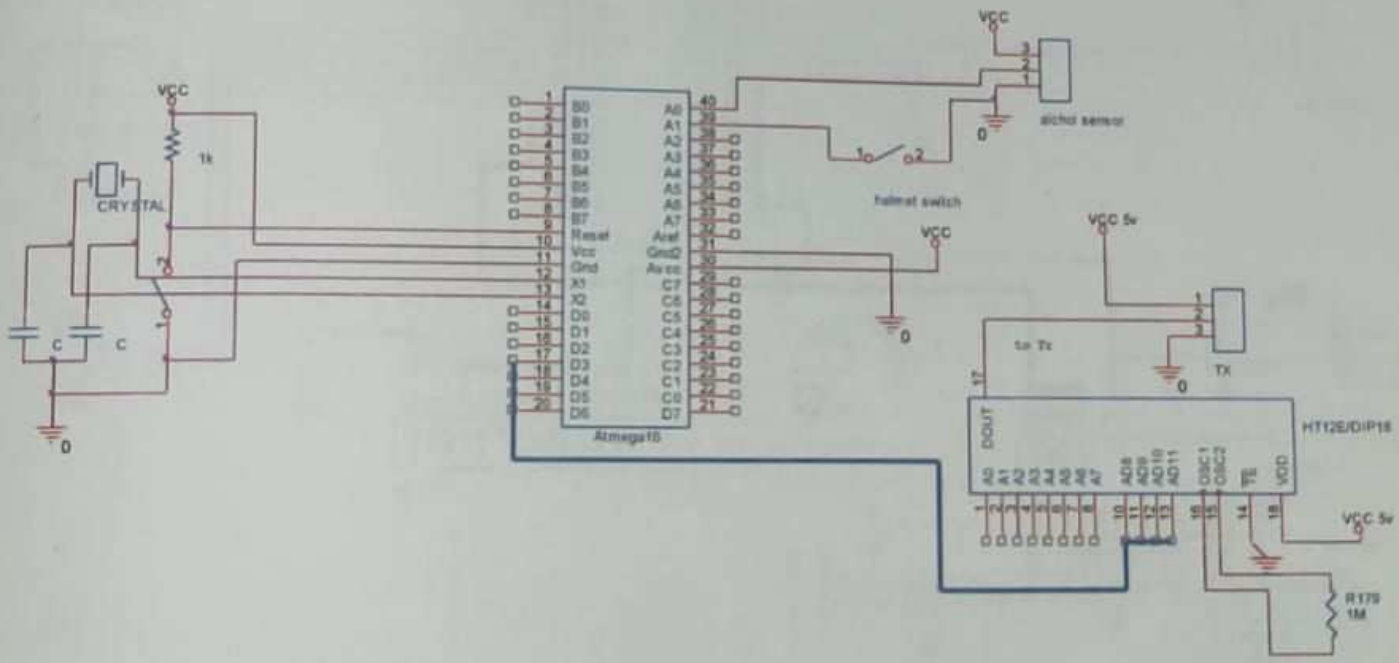
The idea of this work is to give information about the rider wearing the helmet or not, whether the rider drunken or not and also, giving a alert when the driver is crossing the speed limit.

## SOCIAL RELEVANCE

The project offers protection from inadequate roads and bad driving conditions that is common in countries like India. According to statistics serious head injuries can happen even in low speeds. Ninety percent of head injury cases are due to road traffic accidents, about 72 percent are youngsters in the age group of 18 to 40. At least three young men using two wheelers die every year.

# WORKING

## 4.1 HELMET UNIT




(Fig 8) Transmitter circuit diagram

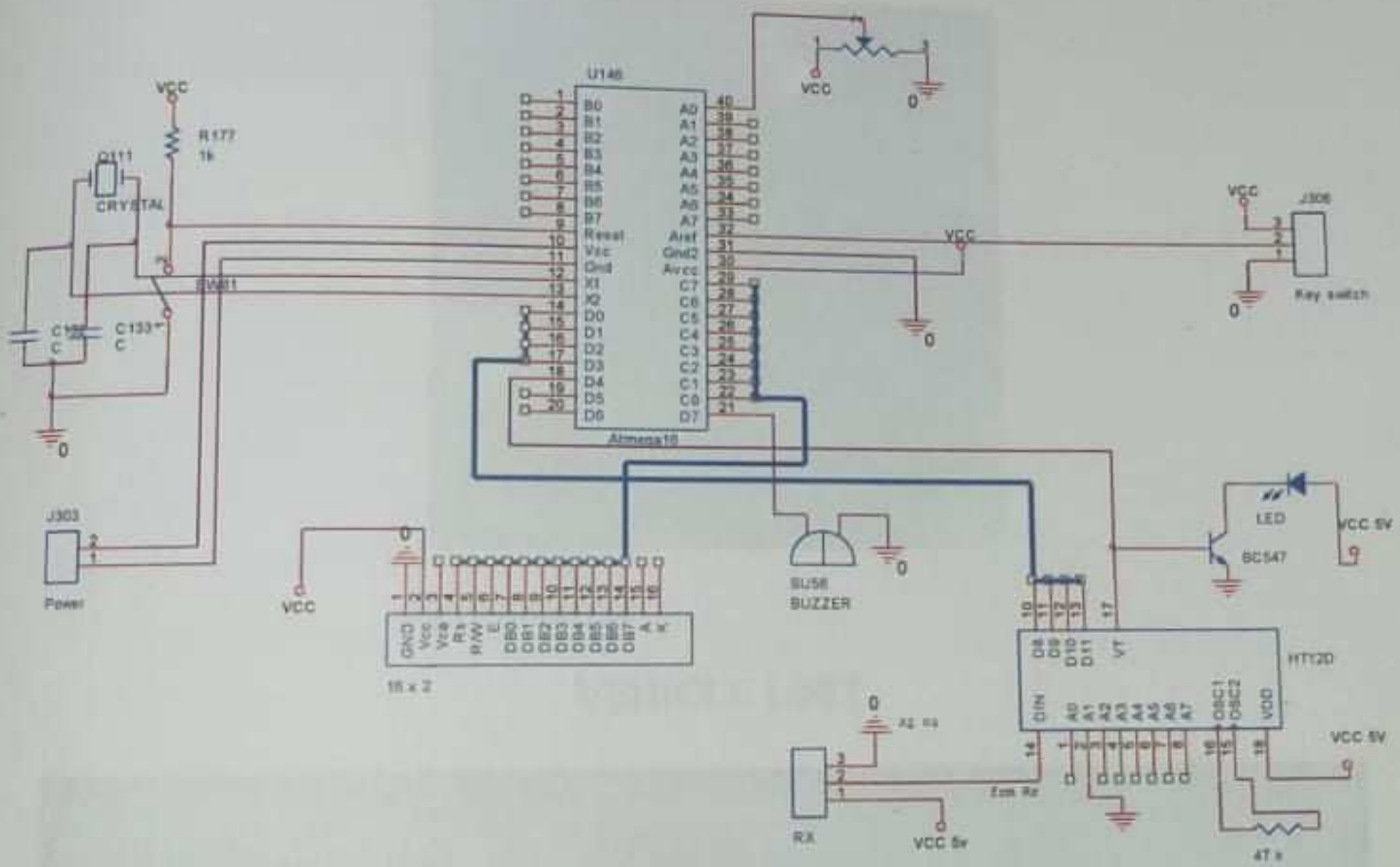
The helmet works only when we switch on the DPDT switch in the transmitter. The DPDT switch is connected to the LCD display of the receiver. The LCD is displayed when,

1) Helmet is worn.

2) Alcohol is consumed.

3) Speed increases above a certain limit.

## 4.2 VEHICLE UNIT




(Fig 9) Receiver circuit diagram

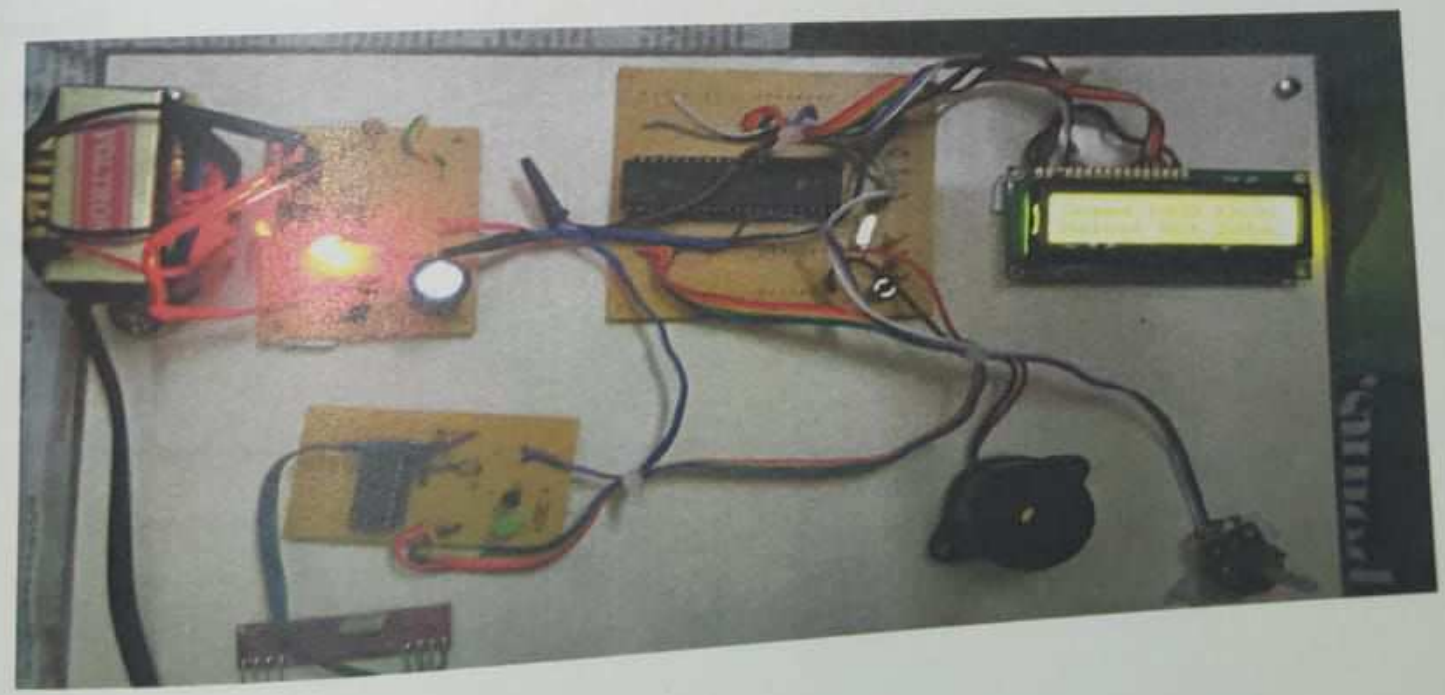
There is switch inside the helmet. The switch is placed at top of the helmet. When the helmet is wearied, switch inside it get turned ON and data is transmitted to the LCD.MQ-3 alcohol detector is used for the alcohol detection. This alcohol detector is placed in front of the helmet. The alcohol detector senses the alcohol and this data is send to the LCD .LCD is displayed as 'ALCOHOL DETECTED', when the alcohol is sensed.LCD is displayed also when the speed increases above a certain limit The speed is increased through a speed variable port .When the speed is increased to 60 km/hr. The buzzer get turned ON and the data is transmitted to the LCD.LCD is displayed as 'OVERSPEED', when the speed reaches beyond a limit.

## 4.3 IMPLEMENTATION

HELMET UNIT

(Fig 10) Helmet Unit

VEHICLE UNIT



(Fig 11) Vehicle unit

# CONCLUSION

This project has a good real life scope, if it is implemented by the government. It can help to reduce lot of road accidents of two wheelers as it is the major cause of deaths in the whole world. It can also help to prevent the damage occurred to the vehicle by the accidents. So this helps in curbing the road accidents by implementing mandatory helmet protection and detection of alcohol content during the start of the bike. This project here is undertaken keeping in view of traffic, the traffic rules and also the Safety of people.

Implementation of this type of project by the government saves a lot of time for the traffic police and most importantly saves the precious life of a person as one cannot run a motor vehicle once he is drunk and if the helmet is not present.

# FUTURE SCOPE

In future if there is a large demand of this type of helmets we can manufacture the whole circuit in printed circuit board, so that circuit becomes smaller and can be easily fitted into helmet. The circuit can also be powered by solar energy so that it use green energy and does no harm to environment. The flexible solar panels can fixed all along surface of helmet. This type of helmet technology can be implemented for the combat helmets used by the working under extreme temperatures.