



SMART HELMET FOR ALCOHOL DETECTION

Apurba Basumallick¹, Akash Bhattacharyya¹, Somshubhra Bose¹, Anirban Saha¹

Sanghamitra Layek²

Department of Electronics and Instrumentation Engineering

Narula Institute of Technology

81, Nilgunj Road, Agarpara, Kolkata-700109

Corresponding author's email: basumallickapurba05@gmail.com

ABSTRACT: In recent times, there has been a significant rise in the worldwide focus on road safety, and a notable part of accidents and deaths can be linked to drunk driving. By developing an intelligent helmet that incorporates an alcohol-detecting sensor, it becomes possible to identify drunk drivers in real-time. This paper introduces an innovative method for improving road safety. The proposed smart helmet utilizes advanced alcohol detection technology to analyze the driver's breath and detect the presence of alcohol molecules when they exhale. These non-invasive and non-intrusive sensors are made to deliver precise measurements of the blood alcohol content quickly, allowing for the prompt identification of potentially drunk drivers.

a significant impact is in enhancing safety of our roadways among the most pressing concerns in road safety is alcohol impairing a leading cause of accidents and fatalities worldwide to combat this problem we introduce the concept of a smart helmet with alcohol detection a groundbreaking innovation designed to detect alcohol intoxication advisers and contribute to a safer and more responsible driving environment.

A proactive and cutting-edge technological solution to this specific problem is the Smart Helmet with Alcohol Detection. By incorporating state-of-the-art alcohol sensing technology into a driver's helmet, this ground-breaking gadget continuously checks the person's rate for the presence

KEYWORDS: road safety, alcohol impair driving, alcohol detecting sensor, alcohol concentration.

1.0. INTRODUCTION:

The advent of technology has continuously reshaped the way we address various challenges and one area where it has made

of alcohol molecules. When alcohol intoxication is detected, it operates in real time and provides rapid input to the wearer as well as other parties like law police or designated contacts.

This paper attempts to improve road safety while simultaneously increasing public awareness of the risks associated with drunk driving. The Smart Helmet is a powerful tool for preventing accidents and saving lives, and it seeks to supplement ongoing efforts to combat drunk driving by combining conventional methods with a cutting-edge strategy that makes use of contemporary technology. The Smart Helmet embodies the principle of responsible drinking and responsible driving.

We'll go deeper into the technical details, design considerations, and potential advantages of the Smart Helmet with Alcohol Detection in the parts that follow, illuminating how this innovation might help create a safer, more accountable, and responsible driving culture in our communities.

2.1. MOTIVATION BEHIND THE PAPER:

The initiative for alcohol-detection smart cars was originally inspired by the need to combat the fatal and pervasive issue of drunk driving. The creation of such a gadget is driven by a number of major motives:

- **Public safety:** Worldwide, drunk driving contributes significantly to traffic accidents, injuries, and fatalities. These mishaps cause

incalculable human misery and financial losses. This paper, which is driven by a dedication to public safety, seeks to lessen the number of accidents caused by alcohol and save lives.

- **Preventative Approach:** Traditional techniques used by law enforcement to identify drunk drivers, such as field sobriety tests and Breathalyzer testing, are reactive in nature. An alcohol-detection feature on a smart helmet adopts a proactive approach by seeing drunk drivers before they even get behind the wheel, so preventing accidents from happening in the first place.
- **Immediate Feedback:** When alcohol intoxication is detected, the Smart Helmet immediately notifies any nearby external authorities. This quick reaction enables prompt intervention and may discourage people from trying to drive while intoxicated.
- **Technological Advancements:** The goal in developing preventable equipment like smart helmets that can accurately detect alcohol intoxication is to use technological breakthroughs for the benefit of society as a whole. Advances in sensor technology, data processing, and communication systems have made it possible.
- **Compliance with legal limits:** There are stringent legal restrictions on driving while intoxicated in several nations. The smart helmet can assist people in adhering to these limitations and avoiding the negative legal repercussions of going over them.

3.1. COMPONENTS LIST:

1. Helmet
2. Power Supply
3. Arduino Uno
4. MQ-3 Alcohol Sensor
5. Transmitter and Receiver Module
6. Buzzer
7. Switch
8. Connecting Wires
9. LED light
10. 5V Relay
11. BC547 Transistor

the bike unit using the transmitter.

4.3. Block diagram of bike unit:

4.1. METHODOLOGY:

4.2. Block diagram of helmet unit:

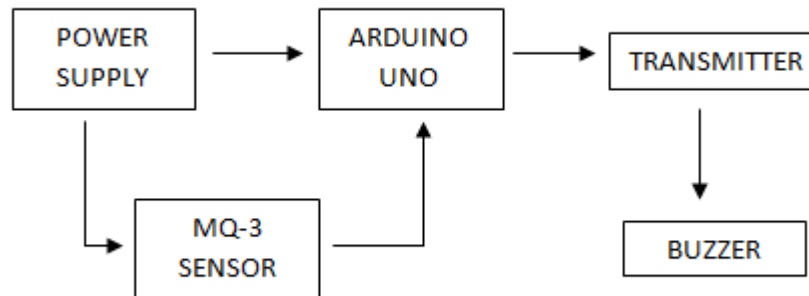


Figure: 01 Working Process in helmet unit

Here, we have used arduino uno as the microcontroller of this device. The arduino uno receives the inputs from MQ-3 sensor which is used for alcohol detection from a person's breath. This device will provide the data of amount of alcohol molecules to arduino uno. Those signals are analyzed inside the microcontroller by a custom written algorithm whenever either signal identifies a danger situation the controller will inform the writer with the alarm and send a lockdown command to

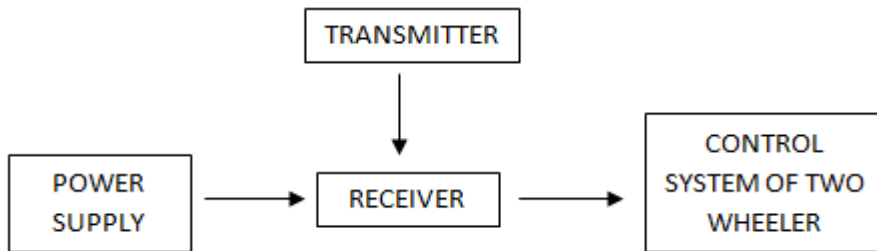


Figure: 02 Working Process in bike unit

According to this block diagram, whenever the controller unit receives a lockdown command to the receiver it will check whether the bike is running or not. If the bike is not running the controller unit will cut off the power to the ignition unit. If the bike is running a high frequency alarm will be fired to indicate the danger to the

rider. There were products to detect alcoholic bike riders but the uniqueness of this product is this it can detect both alcohol individually and lockdown or raise the alarm according to the situation this is specifically designed for bike riders.

5.0. CIRCUIT ANALYSIS:

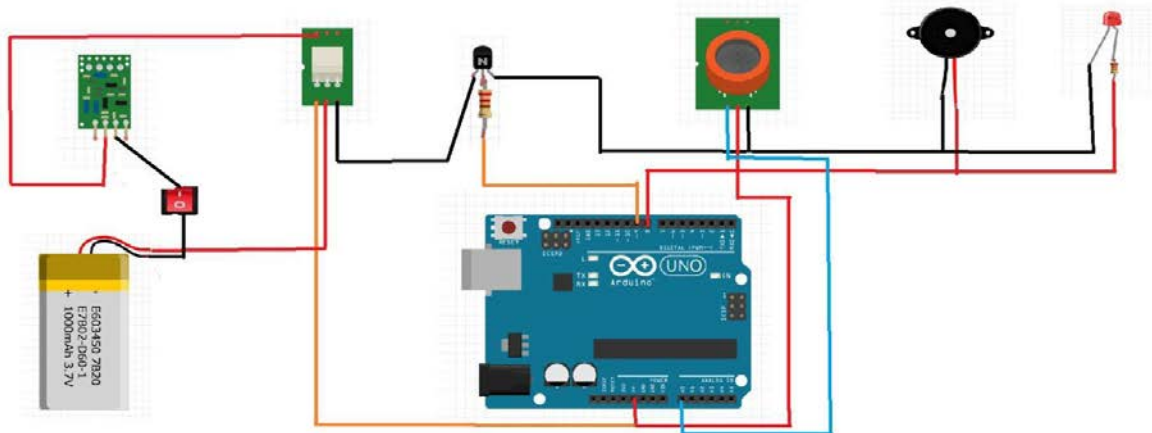


Figure: 03 Circuit analysis in helmet unit

This is the circuit analysis of the connections that we have implemented in the helmet section. Based on this connection, the first step of our smart helmet starts functioning.

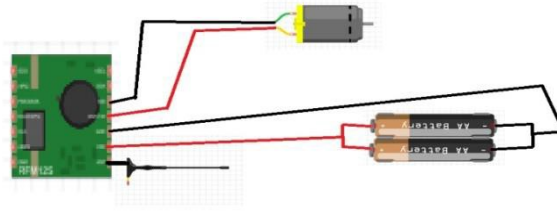


Figure: 04 Circuit analysis in bike unit

This is the circuit analysis of the connections that we have implemented in the bike's control section. Based on this connection, the second step of our smart helmet starts functioning leading to the complete safety of the driver.

6.0. CONCLUSION:

The safety of the bike riders can be increased using this helmet by getting some of the major causes of accidents such as alcohol consumption. Above mention situations will identify by the system and will inform the driver by an alarm at the same time the ignition system will not function if the rider has not started the bike yet. If the system detects either of those causes while the bike is moving the writer will receive the warning message using the high frequency alarm and he will be commanded to stop the bike immediately. With the success of this paper, we would like to develop much more advanced devices to provide help to our society. In the end, we would like to thank our mentor Mrs. Sanghamitra Layek Madam for her great contribution in our paper. Without her guidance and support, this paper wouldn't become a success.

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