A Review Paper on Safety System in Bike to Prevent Use of Mobile While Riding

Tejas. R. Mandhane, Ayush. S. Yeole, Vedant S. Patole, Prathamesh N. Rakade
Department of Mechanical Engineering
Guru Gobind Singh Polytechnic, Nashik, India

Abstract*: This research presents the design and implementation of a safety system for two-wheelers aimed at reducing accidents caused by mobile phone use while riding. The system monitors the rider's hand position and triggers a buzzer if the left hand is removed for more than 30 seconds, followed by an ignition cutoff if the rider continues to ride without proper hand placement. The system ensures that the rider cannot restart the vehicle until a set time has elapsed. Testing shows promising results in enforcing.*

Keywords: safety system

I. INTRODUCTION

With the rise in road traffic, two-wheeler riders face significant risks, especially when distracted by mobile phones. Statistics show that a considerable portion of road accidents are due to mobile phone use while riding, causing loss of focus and reduced reaction time. Unlike four-wheelers, two-wheeler riders need full control and balance, which is compromised when one hand is engaged with a phone.

• Objective: The objective of this project is to develop a safety system that prevents mobile usage while riding two-wheelers by detecting unsafe actions and automatically turning off the vehicle's ignition.

• This aims to reduce distracted driving and promote safer road habits.

The project focuses on enhancing road safety by preventing mobile usage while riding two-wheelers.

It aims to minimize accidents caused by distractions from mobile phones, particularly for two-wheeler riders who are more vulnerable.

The system use sensors and an automated safety mechanism to prevent accidents.

II. PROBLEM STATEMENT

Despite numerous laws prohibiting mobile phone use while riding, compliance remains low, and accidents continue to occur. A system that enforces hands-on-handlebar riding could save lives by reducing distractions.

In India, many accidents are caused by riders using mobile phones while driving. This project addresses the lack of an automated system to prevent mobile usage without manual intervention. Despite laws, enforcement is not strict enough, leading to an urgent need for a safety device .

1997 road accidents occurred in 2021 due to the use of mobile

III. LITERATURE REVIEW

Various studies have identified mobile phone use as one of the leading causes of distracted driving. Distracted riders are significantly more likely to be involved in accidents. While existing solutions include mobile apps that block notifications, there is no physical system enforcing rider behavior. This proposed safety system directly interacts with the bike?s operation, ensuring immediate action when the rider removes their hand from the handlebar

IV. METHODOLOGY

System Overview

The system operates based on the riders hand position. If the left hand is removed from the handlebar for more than 30 seconds, a buzzer starts sounding. If the rider fails to place their hand back on the handlebar within the buzzers time limit (1-30 minutes), the vehicles ignition is automatically turned off, preventing further riding until a safety delay period elapses.

V. STEPS

1. Hand Detection: A sensor detects the removal of the left hand from the handlebar.
2. Buzzer Activation: If the hand remains off for 30 seconds, the buzzer sounds to alert the rider.
3. Ignition Cutoff: After a predetermined time, the ignition system is turned off.
4. Restart Timer: A second timer (lasting 1-2 minutes) prevents immediate restarting of the vehicle.
5. Vehicle Restart: Once the timer expires, the ignition system can be restarted.

VII. DESIGN AND COMPONENTS

The system consists of:
- Hand detection sensor: Monitors hand placement.
- Buzzer: Alerts the rider if the hand is removed.
- Microcontroller: Controls the systems timing and ignition cutoff.
- Ignition control relay: Manages the vehicles ignition system based on the sensor input.
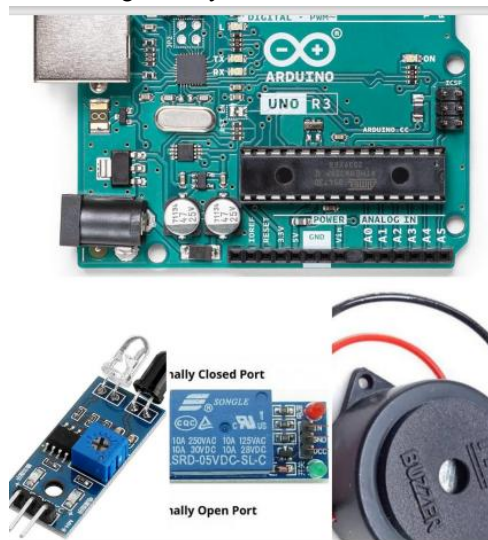
VII. IMPLEMENTATION

This safety system can be implemented on any two-wheeler by installing a sensor on the left handlebar that detects hand removal. The sensor is connected to a microcontroller that manages the timers for the buzzer and ignition cutoff. The ignition relay can be easily wired into the vehicle's ignition system, ensuring that the rider cannot bypass the safety mechanisms.
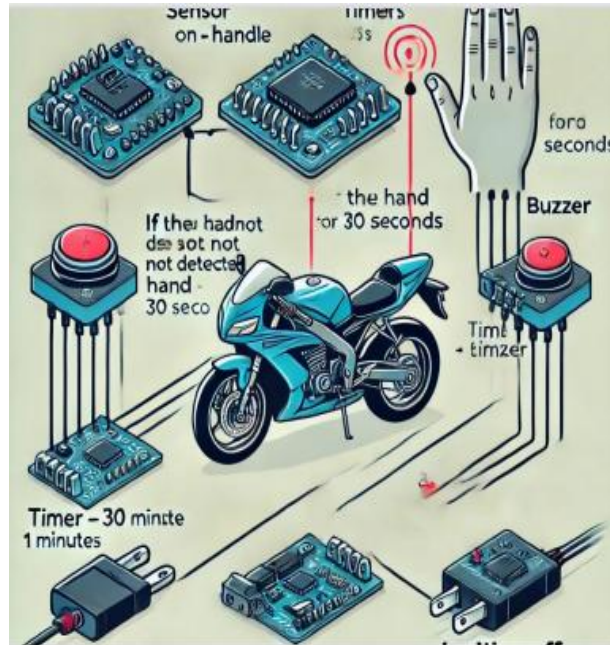
Advantages

1. Safety: The system ensures that the rider's hand is on the handlebar. If not, it will cut off the ignition after a buzzer alert, preventing any accidents due to unintended vehicle operation.

2. Anti-Theft Feature: This system can act as an anti-theft mechanism. If a thief tries to operate the vehicle without holding the handle, the ignition will be disabled after the alert.

3. Accident Prevention: In case the rider loses consciousness or is incapacitated and their hand is no longer on the handle, the system will ensure that the vehicle does not continue running, reducing the chances of the bike being involved in an accident.

4. Battery and Fuel Conservation: The ignition turning off after the alert helps in saving fuel and battery when the bike is left unattended for a long time.

5. Automated Alert: The buzzer provides a direct warning, ensuring the rider is aware of any potential safety concerns

Disadvantages

1. False Alarms: If the rider accidentally lets go of the handlebar for a moment (like when turning or adjusting), the system might trigger the buzzer, causing unnecessary alerts.

2. Malfunctioning Sensors: If the hand presence sensor malfunctions or becomes dirty, it might fail to detect the rider's hand properly, either disabling the bike unnecessarily or allowing the bike to run without the rider's hand on the handle.

3. User Discomfort: Some riders might find the buzzer annoying, especially if they momentarily remove their hand from the handlebar (e.g., while adjusting their posture or taking a break).

4. Power Consumption: The sensors, timers, and the buzzer might consume additional power, which could drain the battery over time if not managed properly.

5. Complicated Maintenance: The system would require regular maintenance to ensure sensors are properly calibrated and functioning, and there's a possibility of increased costs due to additional component

VIII. CONCLUSION

This safety system offers a practical solution to the growing problem of distracted riding due to mobile phone use. By directly interacting with the vehicle?s ignition system, it ensures that riders maintain both hands on the handlebar, significantly reducing the risk of accidents. Further enhancements, such as integrating this system with GPS or mobile networks to send alerts to authorities in case of emergency, could make it even more effective.

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