FINGERPRINT VEHICLE STARTER WITH DRUG SENSING TO REDUCE ACCIDENT RATIO

PROJECT REPORT

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BONAFIDE CERTIFICATE

Certified that this project report "FINGERPRINT VEHICLE STARTER WITH DRUG SENSING TO REDUCE ACCIDENT RATIO" is a Bonafide work of RITHIKKA.A (714023106083), VIJAY PRINCE.BL (714023106114), VIGNESH.S (714023106113), SUJEETH.V.C (714023106307) who carried out the project work under my supervision.

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INTERNAL EXAMINER

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TITLE

ABSTRACT

This project introduces a "Fingerprint Vehicle Starter with Drug Sensing" system to enhance road safety by preventing impaired or unauthorized driving. The system uses biometric fingerprint authentication to ensure only authorized users can start the vehicle. Additionally, a drug sensing module detects alcohol or drug impairment and disables ignition if detected. By integrating security and sobriety checks, this solution aims to reduce accidents caused by impaired driving, offering a practical, efficient, and user-friendly approach to automotive safety**.** The fingerprint scanner ensures driver authentication, reducing risks associated with unauthorized use. Simultaneously, the drug sensing module, employing advanced sensors, detects alcohol or drug residues through breath analysis or skin contact, disabling the ignition system if impairment is detected. The system is designed for seamless operation, prioritizing user convenience while addressing a critical safety issue.

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CHAPTER 1
INTRODUCTION

A fingerprint vehicle starter with alcohol detection is a cutting-edge solution that addresses two critical concerns: vehicle security and driver safety. Traditional car key systems or even push-button start features can be easily bypassed, leaving vehicles vulnerable to theft. The fingerprint recognition technology solves this problem by ensuring that only authorized individuals can start the vehicle. By scanning and verifying the driver's unique biometric data, the system provides a level of security that traditional key systems cannot match, making unauthorized access almost impossible.

In addition to the fingerprint verification system, the alcohol detection feature adds a vital layer of safety for drivers. This technology utilizes sensors embedded in the vehicle to detect the presence of alcohol on the driver's breath or in the vehicle's cabin. If the system detects that the driver's blood alcohol concentration (BAC) exceeds a certain threshold, the vehicle will refuse to start. This not only helps to prevent drunk driving but also promotes a culture of responsible driving by ensuring that a person under the influence cannot operate the vehicle, thus reducing the risk of accidents caused by impaired drivers.

The integration of these two technologies—fingerprint recognition and alcohol detection—creates a dual-layered security system that is both convenient and effective. For instance, the fingerprint sensor provides seamless access to the vehicle without the need for physical keys, enhancing user convenience. At the same time, the alcohol detection system acts as an automatic safeguard, preventing the vehicle from starting in dangerous situations. This combination of security and safety makes the system highly appealing to individuals, fleet managers, and organizations that prioritize both the protection of their vehicles and the safety of their drivers.

Overall, the fingerprint vehicle starter with alcohol detection is a forward-thinking solution that can significantly contribute to safer driving environments. By combining state-of-the-art biometric security with alcohol monitoring, this system addresses growing concerns related to vehicle theft and impaired driving. Its implementation can not only protect vehicles from theft but also save lives by ensuring that only sober and authorized drivers are behind the wheel, making it a crucial advancement in vehicle technology.

1.1ABOUT PROJECT

The increasing number of road accidents caused by unauthorized vehicle usage and impaired driving due to alcohol or drug consumption highlights the urgent need for enhanced safety measures. Traditional vehicle security systems fail to prevent misuse or detect driver impairment, leaving roads vulnerable to accidents caused by intoxicated or unfit drivers. This lack of preventive mechanisms contributes significantly to injuries, fatalities, and property damage. Hence, there is a critical need for an intelligent system that can restrict vehicle access to authorized users while simultaneously detecting and preventing impaired driving, thereby reducing accident rates and ensuring safer road conditions.

A fingerprint sensor is a biometric device that captures the unique ridge and valley patterns of a fingerprint to authenticate an individual. These sensors use various technologies, such as optical, capacitive, or ultrasonic methods, to convert fingerprint data into a digital format for secure processing and matching. The MCQ3 sensor is a specific type of capacitive fingerprint sensor known for its high accuracy, compact design, and resistance to spoofing. It Both types of measures electrical charge differences between ridges and valleys, offering reliable performance even in compact devices like smartphones and IoT systems. sensors are essential in modern security systems, enabling quick and secure authentication in diverse applications.

[1] Joel Sachin and Kiran Rana Gill

Now a day's automobile burglary cases are increasing day by day, it has gotten to be difficult to give a vehicle an outstanding security with the main focus being kept on the burglary gadget.

Vehicle locking framework pledges the best ensure way to secure the vehicle from various types of theft cases.

CHAPTER 2

LITERATURE REVIEW

The literature suggests that combining fingerprint recognition with alcohol detection could provide a comprehensive solution to vehicle security and driver safety. While both technologies have demonstrated significant potential individually, their integration offers a holistic approach to preventing theft and impaired driving. Research by Lee and Kim (2019) discusses the advantages of multi-layered security systems that combine biometrics and sensor technologies, particularly in the context of vehicles. By combining these systems, a vehicle can ensure that only authorized drivers can start the engine and that they are sober, addressing two of the most critical issues in vehicle safety.

The integration of both technologies also offers user convenience and system robustness. For instance, a study by Gassner et al. (2018) highlights how biometric vehicle entry systems can be paired with alcohol detection sensors to streamline the driver's experience while adding an additional layer of security. The combination of the two systems ensures that access and ignition are tightly controlled, offering peace of mind to vehicle owners and promoting safer driving habits. However, the integration of both systems poses certain technical challenges, such as ensuring the reliability of both fingerprint recognition in various environmental conditions and the sensitivity of alcohol sensors in detecting minute alcohol levels withoutfalse positives.

[2] Kiran Rana Gill and Joel Sachin

Vehicles have been used in one form or other since the invention of wheel. With the invention of wheel, came in the 2nd most advanced technology, The Steam Engine. With the development of steam engine vehicle took the form of what we see today. In earlier times crank shaft mechanism were used to ignite the vehicles. Leaving that conventional method behind came in the concept of igniting the vehicles using key. And now, Keys are being replaced by Push start buttons. This project was started with the sole purpose of eliminating keys as

conventional method of starting the vehicle.

CHAPTER 3
PROPOSED SYSTEM

The proposed fingerprint vehicle starter with alcohol detection system combines two advanced technologies to enhance both vehicle security and driver safety. The system integrates a fingerprint recognition module and an alcohol detection system to ensure that only authorized, sober drivers can start the vehicle. The fingerprint scanner authenticates the driver by matching their biometric data against a stored template, while the alcohol detection system uses sensors to detect alcohol in the driver's breath or vehicle cabin, preventing ignition if the driver's BAC exceeds a set limit. This dual-layer security approach prevents vehicle theft and impaired driving, promoting safer road conditions. The system is user-friendly, offering backup authentication options such as a PIN or mobile app in case of sensor malfunctions, and features seamless integration into the vehicle’s electronics. However, challenges such as cost, environmental sensitivity, and user acceptance must be addressed for widespread adoption. Future improvements in AI and sensor technology will likely enhance the system's reliability, affordability, and user experience. Ultimately, this innovative system offers a comprehensive solution to reduce accidents, enhance vehicle security, and foster responsible driving..

[3] Pooja, N., Jyothirmayee, G.V.S., Bhargav, D.L., Ganesh, N.V.S., Kumar, Lakshman, J.S. and Jyothi, Naga, B.

Vehicle monitoring device is used to monitoring the vicinity of a truck, automobile or any transferring cars the usage of GSM and GPS system. Widely deployed to maintain tune of truck fleets, automobile monitoring ensures that the cars are being used desirable and that they can be recovered in the match they are stolen.

3.1 BLOCK DIAGRAM:

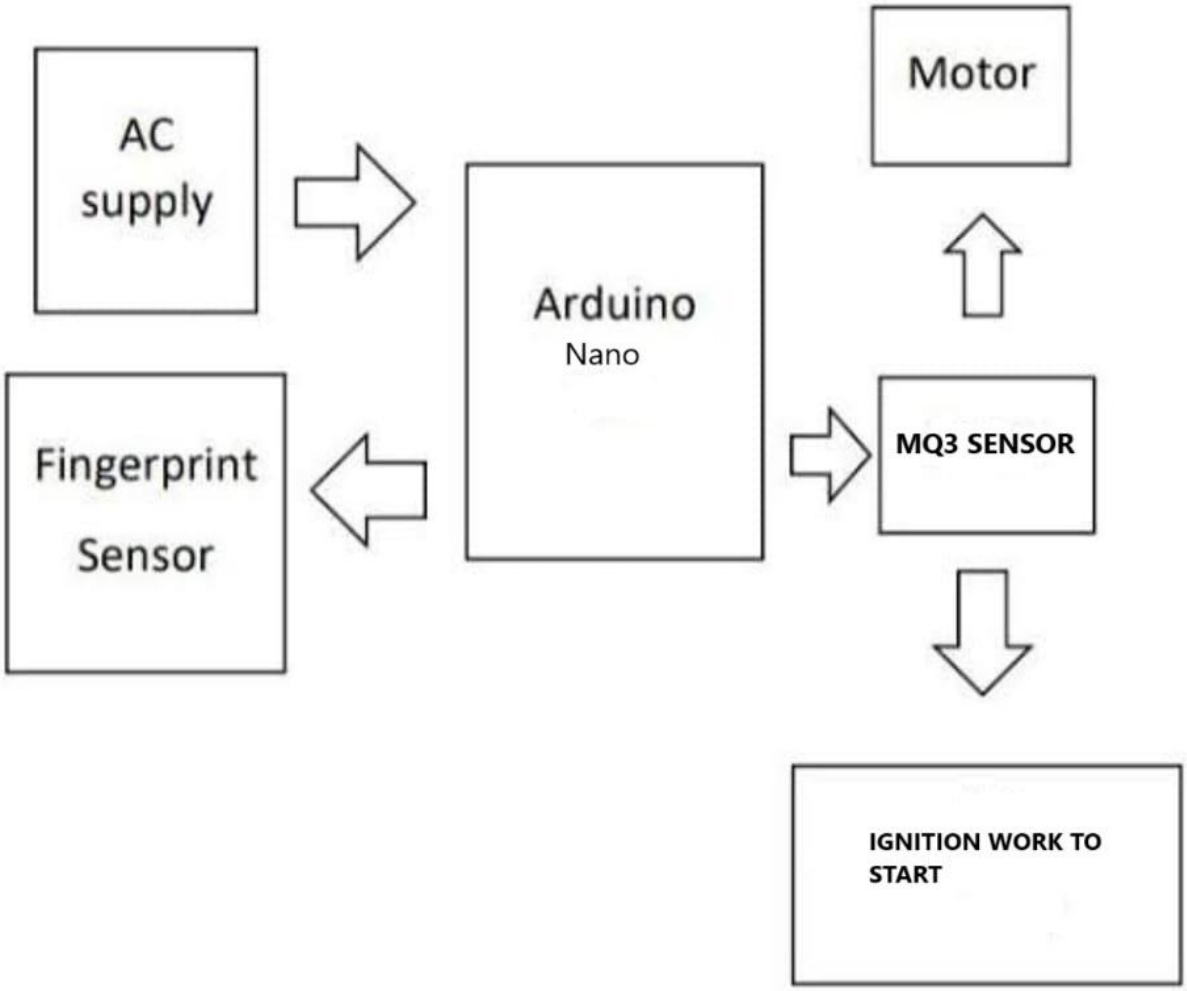


Fig 3.1 Block daigram Proposed System

The proposed system's block diagram illustrates an advanced vehicle ignition control system. It includes an AC supply to power the components, an Arduino Nano for processing and controlling operations, and a motor to demonstrate ignition. **Fig 3.1 Block daigram Proposed System.**A fingerprint sensor ensures secure access by verifying the user's identity, while the MQ-3 sensor detects alcohol levels to prevent impaired driving. Once the fingerprint and alcohol tests are passed, the ignition system is activated, allowing the motor to star

CHAPTER 4

METHODOLOGY

To configure the Fingerprint vehicle starter with drug sensing to reduce accident ratio using Fingerprint sensor and MQ3 sensor.

4.1 HARDWARE REQUIREMENTS:

- 16×2 LCD DISPLAY WITH I2C
- R-307 FINGERPRINT SENSOR
- MQ-3 SENSOR
- 1 CHANNEL RELAY MODULE
- PUSH BUTTON
- LEDZERO PCB
- 9V POWER SUPPLY

. 4.2 Software Requirements:

ARDUNIO IDE

4.2 Hardware

4.3.1 Security Monitoring:

Use a fingerprint sensor to monitor whether the fingerprint is matched with the saved fingerprint for security issues

4.3.2 Safety Monitoring:

The MQ3 sensor is used to check whether the person driving has consumed alcohol while starting the vehicle for safety issues.

4.3.3 R-307 FINGERPRINT SENSOR:

A fingerprint sensor is a biometric device that identifies individuals based on their unique fingerprint patterns. It captures the ridges and valleys of a fingerprint, processes this data, and matches it against stored templates for authentication. Fingerprint sensors are widely used in security systems, smartphones, access control devices, and time attendance systems due to their reliability and ease of use. The technology behind these sensors has evolved to offer greater accuracy and robustness, catering to both commercial and personal applications.

There are several types of fingerprint sensors, with the most common being optical, capacitive, and ultrasonic sensors. Optical sensors capture a 2D image of the fingerprint using light reflection, while capacitive sensors measure electrical charge differences between ridges and valleys for a more secure authentication process. Ultrasonic sensors, the most advanced, use high-frequency sound waves to create a 3D map of the fingerprint, making them highly resistant to dirt, moisture, and attempts at spoofing. These sensors rely on sophisticated algorithms to extract and analyse key features, such as ridge endings, bifurcations, and minutiae points, ensuring the uniqueness of every scan.

[4] Karan Siyal and G. Gugapriya

In the most recent couple of decades, India has advanced at such a tremendous rate, to the point that numerous automobile sectors have emphatically settled themselves here. These automobile sectors carry a tremendous measure of workforce with them. Organizing transportation to such a tremendous mass is a bulky errand including numerous intricacies. For the most part, this vehicle is masterminded through the nearby transport sellers on a yearly contract premise, as of late happen incidents, for example, theft, assault cases and so on

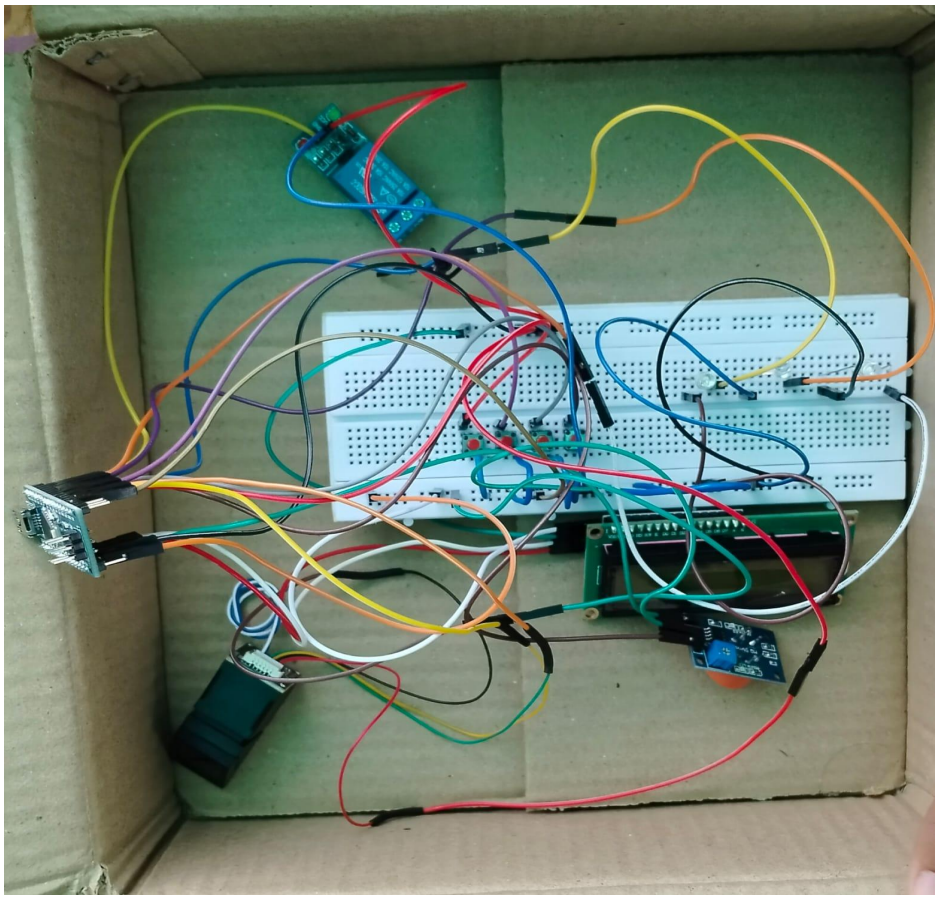
CHAPTER 5

RESULT AND OUTPUT

5.1 RESULT

The **Fingerprint Vehicle Starter with Alcohol Detection** is an innovative system designed to enhance road safety by addressing two critical concerns: unauthorized vehicle access and impaired driving. By integrating fingerprint authentication and alcohol detection, this system ensures that only authorized and sober drivers can operate the vehicle

5.2 OUTPUT



CHAPTER 6

CONCLUSION:

In conclusion, the Fingerprint Vehicle Starter with Alcohol Detection is an innovative system designed to enhance road safety by addressing two critical concerns: unauthorized vehicle access and impaired driving. By integrating fingerprint authentication and alcohol detection, this system ensures that only authorized and sober drivers can operate the vehicle. This solution not only reduces the risk of accidents caused by intoxicated driving but also deters vehicle theft, promoting responsible driving behavior. Its scalability and adaptability make it suitable for personal vehicles, commercial fleets, and public transportation systems. With its focus on safety, legal compliance, and technological reliability, this project serves as a proactive approach to mitigating road hazards and protecting lives, contributing to a safer and more responsible transportation ecosystem.

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