DAYANANDA SAGAR ACADEMY OF TECHNOLOGY AND MANAGEMENT

Accredited by NAAC with Grade A+

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Engineering Exploration Course [23EEXC28]

Project Report

on

"ALCOHOL DETECTING SENSOR WITH ENGINE LOCKING SYSTEM"

"Good health and well-being"

Submitted by

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In partial fulfilment of the requirement for the degree of

BACHELOR OF ENGINEERING

Under the Guidance of

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DAYANANDA SAGAR ACADEMY OF TECHNOLOGY AND MANAGEMENT

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This is to satisfy that the **Engineering Exploration Course** project work entitled "**ALCOHOL DETECTING SENSOR WITH ENGINE LOCKING SYSTEM** " under the "**SDG-3 GOOD HEALTH AND WELL BEING**" carried out by **T.MARILYN PIOUS (IDT23IS086), M.SATYA PRAVINYA (1DT23CA023),A.NARENDRA REDDY (1DT23IS023) and ED.KALYAN (1DT23EC023),** a bonafide student of **DAYANANDA SAGAR ACADEMY OF TECHNOLOGY AND MANAGEMENT** in Bachelor of Engineering of Visvesvaraya Technological University, Belagavi during the academic year 2023-2024. It is certified that all the corrections/suggestions indicated for internal assessment have been incorporated in the report. The project report has been approved as it satisfies the academic requirement in respect of the Engineering Exploration Course prescribed for the degree

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Dr. Vatsala G A	**Dr. Roopa R kulkarni**	**Dr. Ravishankar M**

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1.		
2.		

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Sincerely,

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ABSTRACT

Context and Purpose

Worldwide, drunk driving is a key factor in traffic accidents that result in injuries and fatalities. The World Health Organization (WHO) estimates that alcohol-impaired drivers cause a large percentage of the 1.35 million fatalities caused by traffic crashes that occur each year. Beyond the immediate repercussions of collisions, drunk driving has a negative influence on families, communities, and healthcare systems. Globally, a number of responses to this urgent problem havebeen put into place, such as strict legislation, public awareness campaigns, and sobriety checkpoints. But even with these initiatives, drunk driving is still an issue. This has prompted the creation of technical solutions to offer a proactive and trustworthy way of stopping intoxicated people from driving, such as alcohol-detecting sensors and engine lock systems. The development and implementation of alcohol-detecting sensors and engine lock systems have the potential to make a significant impact on global road safety, supporting the United Nations' Sustainable Development Goal (SDG) 3.6, which aims to halve the number of global deaths and injuries from road traffic accidents by 2020.

How alcohol detecting sensor works

The integration of a sensor module, microcontroller unit (MCU), engine lock relay, and power supply is how an alcohol-detecting sensor with engine lock system operates. By using transdermal detection, the sensor module determines the amount of alcohol in the driver's skin or breath and transmits the signal to the MCU. After processing the signal, the MCU compares it to a preset threshold, such as 0.08% BAC. The engine lock relay receives a signal from the MCU if the alcohol level is higher than the threshold. This signal causes the engine to become immobile by cutting off the fuel or ignition system. This stops the car from starting and from running again. Additional features like buzzers, warning lights, or alerts to notify authorities or drivers may also be included in the system. For more precise detection, certain systems might make use of cutting- edge technology like fuel cell sensors or infrared spectroscopy. The engine lock relay and MCU are usually located in the electrical system of the car or under the hood, however the sensor module can be put on the dashboard, door panel, or steering wheel. The device is made to guarantee precise and dependable detection, preventing intoxicated driving and advancing traffic safety.

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1.1 REPORT'S ORGANIZATION

This study provides a thorough review of the development of prototype engine locking systems in cars with alcohol detection sensors in an effort to increase passenger safety.

The report is organized into sections, each with a specific purpose.

Introduction: Sensors for measuring the amount of alcohol in a person's blood, breath, or other body fluids are known as alcohol detection devices. These sensors are widely employed in many different fields, including workplace safety, medical diagnostics, law enforcement, and personal use.

Problem description and objectives: These sensors are utilized by law enforcement for sobriety tests conducted at the scene of crimes, in workplaces to guarantee worker safety, in medical facilities to monitor patients, and for personal use to discourage drunk driving. Present alcohol detection methods, however, confront a number of difficulties with regard to non-invasiveness, affordability, accuracy, and convenience of use. Objective - By addressing these challenges, the next generation of alcohol detection sensors can significantly impact public health and safety, making reliable alcohol monitoring more accessible and effective.

Review of Literature: Comprehending User and Legal Needs Reviews of the literature include research on user acceptance and the legal frameworks surrounding the detection of alcohol in automobiles:

Acceptance and behaviour of users: examining drivers' opinions of in-car alcohol detection devices, their propensity to utilize them, and any privacy issues that may arise.

Regulatory standards: Examining the laws and rules pertaining to the requirement for alcohol detection in automobiles, including those pertaining to commercial drivers and repeat DUI offenders. This information guarantees that the creation of alcohol detection systems complies with regulatory criteria as well as user needs.

Hardware:

1. Sensor Module: This module houses the alcohol content-measuring sensor (transdermal sensor, Breathalyzer, etc.).

2. Microcontroller Unit (MCU): This device interprets data from sensors and manages the system.

3. Engine Lock Relay: When alcohol is detected, this relay, which is connected to the car's engine management system, cuts the engine.

4. Power Supply: Gives the system electricity.

5.Wiring and Connectors: Forms connections between the parts and incorporates them into the car's electrical system.

Software:

1. Sensor Calibration Software: Adjusts the sensor's parameters to guarantee precise measurements.

2. Algorithm Software: Analyzes sensor data to assess if alcohol content is above the cutoff.

3. Engine Lock Software: This software interprets the signal from the algorithm and instructs the engine lock relay to turn off the engine.

4. User Interface Software: Offers an interface for system status (such as LED indicators and LCD displays), alarms, and settings.

5. Communication Protocol: Facilitates data logging, notifications, and system upgrades by allowing communication between the system and external devices (such as PCs and cell phones).

Together, the hardware and software of the system can:

1. Detect alcohol levels.

2. Process data and make judgments.

3. Manage the relay for the engine lock.

4. Provide notifications and user feedback.

5. Connect to the electrical system of the car.

Accurate alcohol detection, dependable engine lockout, and successful drunk driving prevention are all guaranteed by this integration.

There are multiple applications for the engine lock system's alcohol detecting sensor:

1. Prevents Drunk Driving: The main goal is to stop drunk drivers from operating cars, which lowers the likelihood of collisions and increases traffic safety.

2. Commercial Fleet Management: By using these technologies, fleet managers may lower liability and increase safety by ensuring that their drivers are sober when operating a vehicle.

3. Personal Vehicle Safety: To safeguard themselves and their loved ones from drunk driving, people can install these systems in their own cars.

4. Law Enforcement: These systems can be used by law enforcement organizations to identify and stop drunk driving, particularly in high-risk regions or at special events.

5. These technologies are utilized in ignition interlock devices (IIDs), which are required for some offenders, including repeat DUI offenders.

6. Vehicle Sharing and Rental: By utilizing these technologies, car sharing and rental organizations can make sure that their automobiles are not driven by inebriated individuals.

7. Parental Control: Using these technologies, parents may keep an eye on and regulate their adolescent driver's behaviour to make sure they drive sober and safely.

8. Corporate Fleet Safety: By utilizing these technologies, businesses can guarantee that their staff members drive soberly and safely, lowering liability and fostering a secure workplace.

Road safety, accident reduction, and life preservation can be achieved by people and organizations through the integration of alcohol detecting sensors with engine lock systems.

Conclusion:

Alcohol detecting sensors with engine lock systems are a vital technology for preventing drunk driving and promoting road safety. The hardware and software components work together to detect alcohol levels, process data, and control the engine lock relay, ensuring accurate and reliable operation.

CHAPTER 2

DESIGN THINKING APPROACH

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2.1 INTRODUCTION TO DESIGN THINKING

Understanding human wants and experiences is given priority in the creative problem-solving method known as design thinking. It entails developing user empathy, identifying issues, coming up with original ideas, prototyping, and iterative testing. This human-centred approach emphasizes adaptability and an openness to different viewpoints while promoting collaboration and iteration. Design thinking is a widely used methodology that aims to generate solutions that effectively handle complex challenges and resonate with users in a variety of sectors, including business strategy and product design.

Among the many fields in which it finds widespread application are healthcare and wellness, agriculture, food security, education, financial services, and environmental security. In addition to helping in the digital sphere, design thinking has aided in the creation of tangible goods, sparked social innovation initiatives, and much more.

The First of the Five Stages of Design Thinking: Empathize—Find Out What Users Need

The team members conduct user research as a standard method of trying to understand the issue. Design thinking relies heavily on empathy because it enables designers to put aside preconceived notions about the outside world and develop a deeper understanding of consumers and their needs.

Step 2: Identify—State Needs and Issues of Users

The group gathers data, analyzes observations, and synthesizes findings to identify the main issues. We refer to these definitions as problem statements. To maintain human-centeredness in their work, the team could develop personas.

Step 3: Ideate—Confront Presumptions and Generate Concepts

After laying the groundwork, teams prepare to "think outside the box." They come up with creative answers to the problem statement and discuss different perspectives on the issue. Each team member would present a separate concept during this meeting

Step 4: Prototype—Begin Developing Solutions

This stage is experimental. Finding the best potential solution for every issue is the goal. To test the ideas, the team builds low-cost, simplified copies of the product. Prototypes made of paper might be the easiest this.

Step 5: Test—Examine the Solutions

actual users should try these prototypes to see if they are able to remedy the issue. The test may provide fresh information from which the team refines the prototype in response to testing input or even returns to the Define stage to thoroughly address the problem.

Rather of being consecutive phases, these stages represent distinct modes that contribute to the overall design effort. Acquiring a thorough grasp of the users and their ideal product or solution is the aim. By following these five stages, we can get the intended outcome.

In order to address complicated issues and bring about significant change, design thinking is a potent and cutting-edge methodology that prioritizes empathy, creativity, and iterative learning. A thorough grasp of the requirements and experiences of the user is fostered by putting them at the centre of the design process, which produces more meaningful and relevant solutions. Design thinking's iterative process promotes experimentation and adaptability, enabling ongoing improvement and refinement. This approach not only makes solutions more effective, but it also fosters teamwork within heterogeneous groups by utilizing a wealth of knowledge and viewpoints. Design thinking gives people and organizations the tools they need to negotiate uncertainty, rise to new challenges, and generate value in ways that are sustainable and human-centred in a world that is changing quickly. In the end, design thinking changes the way we solve problems, which makes it an essential tactic for innovation and expansion in the fast-paced world of today.

Fig 2.1,1 design thinking

2.2 INTRODUCTION TO THE SUSTAINABLE DEVELOPMENT GOAL(SDG)

The United Nations approved the Sustainable Development Goals (SDGs), sometimes referred to as the Global Goals, in 2015 as a global call to action to end poverty, safeguard the environment, and guarantee that by 2030 all people live in peace and prosperity.

The 17 SDGs are interconnected; they acknowledge that decisions made in one area will have an impact on other areas and that development must strike a balance between environmental, social, and economic sustainability.

The SDGs must be accomplished in every setting with the help of all societal members' inventiveness, expertise, technology, and financial resources.

The Sustainable Development Goals aim to conserve the environment while removing significant problems like hunger and poverty and bringing about a world of peace and prosperity. This is more crucial now than it has ever been in the middle of the climate catastrophe.

Since all of the objectives are related to one another, accomplishing one frequently requires reaching the others. Only until the objectives are ingrained in every governance will they be accomplished.

Fig 2.2,1 Sustainable development goals

About SDG goal 3- good health and well-being:

The United Nations developed Sustainable Development Goal (SDG) 3, which centres on promoting well-being and guaranteeing healthy lives for all people of all ages. This all-encompassing objective seeks to address a variety of health-related concerns, highlighting the significance of achieving universal health coverage, lowering the burden of disease, and enhancing global health outcomes overall. The following are the main elements and objectives of SDG 3:

1. Lowering Maternal Mortality Target 3.1: By 2030, bring down the global rate of maternal death per 100,000 live births to less than 70.

Relevance: Maternal mortality is an important health indicator that shows how well healthcare services are doing as well as how healthy a population is overall. Maternal mortality can be decreased by increasing access to prenatal and postnatal care, providing competent birth attendance.

2. Ending Preventable Deaths of Newborns and Children Under 5.

Target 3.2: End Preventable Deaths of Newborns and Children Under Five Years of Age: By 2030, all countries should strive to bring down neonatal mortality to a minimum of 12 per 1,000 live births and reduce under-5 mortality to a minimum of 25 per 1,000 live births.

Significance: Elevated rates of infant death frequently point to more extensive health system shortcomings and socioeconomic disparities. Interventions including immunization, proper nutrition, access to clean water, and adequate sanitation are necessary to improve child health.

3. Fighting Infectious Illnesses

Target 3.3: Prevent hepatitis, water-borne illnesses, and other communicable diseases by 2030. End the epidemics of AIDS, TB, malaria, and neglected tropical diseases.

Relevance: Communicable illnesses remain a serious health concern. Effective strategies include widespread vaccination, disease surveillance, and improved healthcare infrastructure.

4. Minimizing Non-Infectious Diseases (NCDs)

Target 3.4: By 2030, preventive, therapeutic, and mental health and well-being-promoting measures should cut the premature death rate from non-communicable diseases by one third.

Relevance: Non-communicable diseases (NCDs) include diabetes, cancer, cardiovascular disease, and chronic respiratory conditions are the world's leading causes of death. Promoting healthy lifestyles, early detection, and efficient management are all part of addressing NCDs.

2.3 CUSTOMER RESEARCH

Fig 2.3,1 customer one

User: Good day! I've heard you're developing a vehicle-based alcohol detection device. Could you elaborate on it for me?

Student: Hello! Yes, I'm working on a project that looks into alcohol detecting technologies that might be used in vehicles to stop drunk drivers. Our method makes use of cutting-edge sensors to determine the driver's blood alcohol content.

User: That's interesting, all right. What is the precise mechanism of operation?

Student: Though there are a few different approaches you may take, in essence, all of them boil down to breath-based versus touch-based sensors. The method by which a breathalyse measures the amount of alcohol exhaled is the same. Alcohol can be read through the skin by contact-based sensors, which are often integrated into the

User: And what happens if the system finds alcohol?

Student: The technology will not allow the engine to start if it finds that the driver's blood-alcohol concentration (BAC) is higher than allowed. Additionally, in the worst-case scenario, the systems might notify emergency personnel or a pre-designated contact.

Fig 2.3,2 customer two

User: I understand how it could save lives, but what about circumstances in which a passenger or someone else except the driver might trigger the sensor?

Student: Excellent. Currently, technology is being created to be as dependable and accurate as possible. For instance, a sensor that measures the amount of alcohol in exhaled air can be placed specifically to detect the breath of the driver, eliminating the need to check the breath of any other passengers and the associated problems with cross-reactions or false positives. Decentralized touch-based sensors only come on when a driver touches something directly, like the start button or steering wheel.

User: Do you have any problems using this technology?

Learner: Ensuring the accuracy and speed of the sensors is a major task. In addition to being prompt enough to avoid bothering the driver, they must be accurate enough to avoid false positives or negatives. Making these devices affordable and effectively integrating them into various automobile models is another hurdle.

Fig 2.3,3 customer three

User: When will this kind of technology be accessible to the general public?

Student: Within the next few years, we hope to see a wider adoption of the prototypes that are currently undergoing testing. It is contingent upon regulatory clearances, collaborations with automakers, and more technological advancements.

User: Although it seems like there is still more work to be done, there is a lot of potential. I appreciate you going over everything.

Student: It is my delight! Please get in touch if you have any more queries or would like updates on our progress.

User: That's great to hear! I'd love to stay updated on your progress. How do you envision this technology being implemented in the future? For example, would it be a standard feature in all new vehicles or an optional add-on?

Student: We're exploring various implementation pathways. Ideally, we'd like to see it become a standard safety feature in new vehicles, similar to airbags or anti-lock brakes. However, it could also be offered as an optional feature or even a retrofitting option for existing vehicles.

Fig 2.3,4 customer four

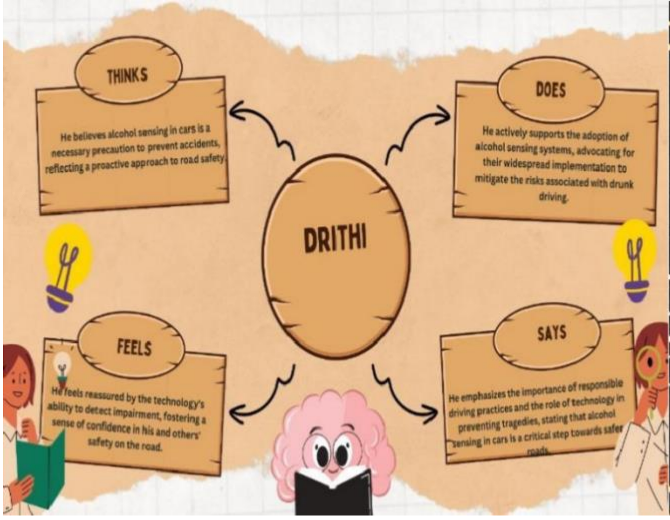
User: Both the technology itself and its useful applications pique my interest. What is the operation mechanism of these systems?

Learner: The majority of in-car alcohol detection systems rely on touch- or breath-based sensors. Similar to a Breathalyzer, the breath-based sensors examine the driver's breath to determine their alcohol content. On the other hand, alcohol levels can be detected via touch-based sensors through the skin, commonly through the start button or steering wheel.

User: That seems like a fascinating idea. Are there any significant initiatives or businesses setting the standard for this technology?

Learner: Yes, the Driver Alcohol Detection System for Safety (DADSS) program is a noteworthy example of a joint research endeavour involving the US government and the car industry. These systems' development also involves firms like Takata and Autoliv.

2.4 EMPATHY MAP



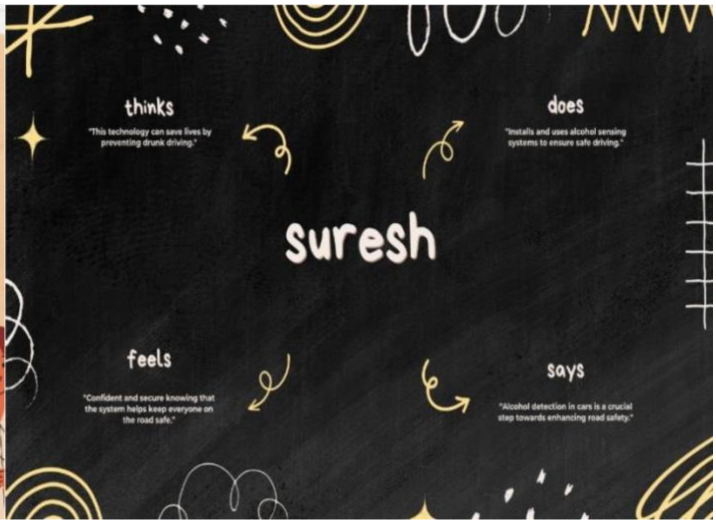


Fig 2.4,1 customer one map

Fig 2.4,2 customer two map

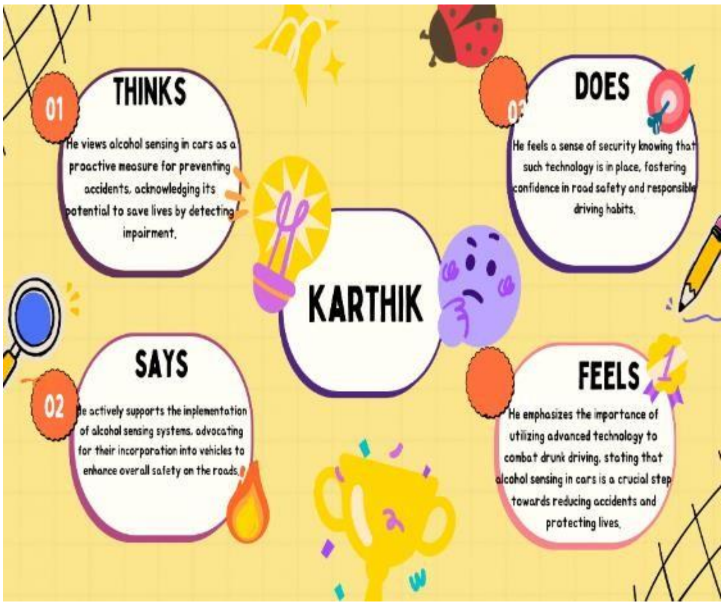


Fig2.4,3 customer three map

Fig 2.4,4 customer four map

2.5 CUSTOMER JOURNEY MAP

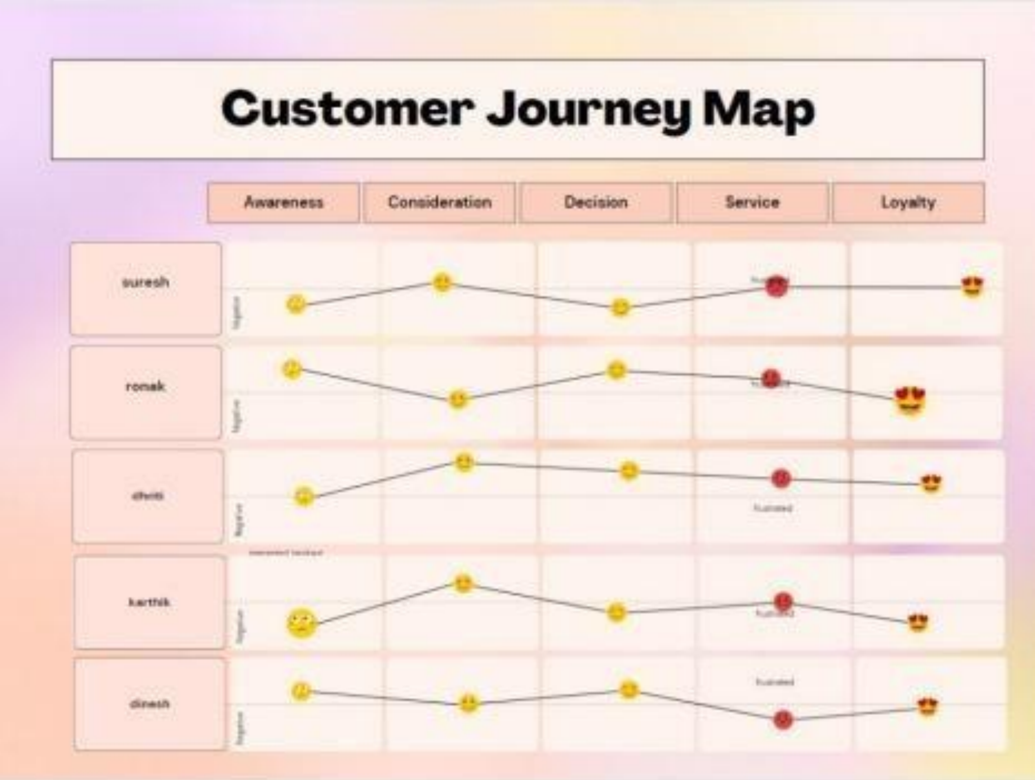


Fig 2.5,1 customer journey map

2.6 NEED STATEMENT TO PROBLEM DEFINITION

Numerous traffic accidents and fatalities worldwide are caused by drunk drivers. Public safety is still seriously compromised by drunk driving, even in the face of severe penalties and legislation. However, conventional methods—such as Breathalyzer testing, which law enforcement has been utilizing to apprehend criminals—are by their very nature limited and reactive. The difficulty of proactively preventing drunk drivers from operating a vehicle requires solutions that are reliable and consistent with providing consumers with a simple and secure experience.

By adopting a proactive, technology-driven approach, we can reduce the likelihood of drunk driving, enhance road safety, and provide a secure experience for consumers. This multi-faceted solution has the potential to save lives, prevent injuries, and foster a culture of responsible driving.

2.7 EXISTING SYSTEM

Observed research papers and articles indicate that this is the current method for identifying alcohol in a car.

1.System: NHTSA Research on Ignition Interlocks and Ignition Interlock Devices (IID)

Investigation: "Evaluation of the New Mexico Ignition Interlock Program"

Results: Among DUI offenders in New Mexico, ignition interlocks dramatically decreased recidivism, according to this study.

Synopsis: These devices, which are installed in the ignition system of cars, demand that the driver blow into a mouthpiece in order to start the vehicle. The car won't start if the blood alcohol content (BAC) is higher than a certain threshold.

2. System: Breathalyzer Sensors Integrated with the Vehicle DASH System Research Project: "Driving Alcohol Detection System for Safety (DADSS): A Joint Research Collaboration to Avoid Driving While Intoxicated"

Findings: To discreetly test blood alcohol content and stop drunk driving, the DADSS initiative is developing touch- and breath-based sensors.

More sophisticated breathalysers that can track a driver's breath in real time are in the works. These devices are frequently built into the interior of the car, including the steering wheel.

3. System: Sensors Based on Touch

Article title: "A Novel Alcohol Sensing System for Vehicle Drivers Using Skin Contact" from the IEEE Sensors Journal.

Results: The design and testing of a touch-based alcohol sensor that can be incorporated into car systems to track a driver's blood alcohol content through skin contact is covered in this article.

These sensors use skin contact to measure blood alcohol content. For instance, the start button or steering wheel may have sensors built into them.

A few more methods already in use include wearable alcohol monitors.

Although they are worn by the driver and have communication capabilities with the car's system, they are not built into the vehicle.

Functionality: Wearables, like wristbands, can notify the car's system if the driver is drunk by continuously monitoring the wearer's blood alcohol content (BAC).

Technology: To identify alcohol expelled through the skin, they use transdermal sensors.

Intelligent Vehicles with In-Car Sensors

In order to identify impairment based on driver behaviour and physiological indicators, advanced systems combine sensors and artificial intelligence.

Functionality: These systems track a number of variables, including reaction times, eye movements, and steering patterns. The device has the ability to inform the driver, slow down the car, or safely stop if it detects impairment.

Technology: Real-time data analysis is done via cameras, biometric sensors, and machine learning algorithms.

2.8 OBJECTIVES

The main goals of automobile alcohol detectors are to increase traffic safety by lowering the amount of alcohol-related collisions and fatalities. Their objectives are to:

1. Prevent drunk driving: These devices can stop drunk people from operating automobiles by measuring the amount of alcohol in the driver's breath.

2. Deterrence: Drivers may be deterred from drinking and driving altogether if they are aware that their vehicle is fitted with an alcohol detector.

3. Enforcement: Law enforcement organizations can use alcohol detectors as a tool to enforce the prohibition on drunk driving and to hold offenders accountable.

4. Preserve lives: Alcohol detectors can save lives and lessen injuries on the roadways by avoiding incidences of drunk driving.

5. Behavioural modification: By highlighting responsible behaviour and the repercussions of driving while intoxicated, alcohol detectors can help modify public perceptions of drinking and driving.

6. Legal compliance: By giving drivers a clear picture of their state of drunkenness prior to operating a vehicle, alcohol detectors assist drivers in adhering to the law's restrictions on blood alcohol concentration (BAC).

The ultimate goal is to lower the dangers related to driving while intoxicated in order to make the road a safer place to drive.

2.9 PROJECT MANAGEMENT

2.9.1 IDENTIFYING MILESTONES

The outlined steps provide a comprehensive framework for a project aimed at addressing alcohol-related issues through detection and intervention.

1.Project Initiation

·Define project goals: Determine the specific objectives, such as reducing drunk driving incidents or improving road safety.

·Identify stakeholders: Include law enforcement, transportation authorities, healthcare professionals, and community organizations.

·Establish scope: Define the project's boundaries, such as targeting specific demographics or geographic areas.

·Define roles and project team: Assemble a team with diverse expertise, including project management, research, marketing, and technical specialists.

2.Analysis of Needs and Research

·Conduct a thorough analysis of alcohol-related issues: Gather data on the prevalence of drunk driving, alcohol-related accidents, and demographic trends.

·Determine target audience demographics and needs: Identify high-risk groups, such as young adults or commercial drivers, and their specific needs and concerns.

3.Strategy Development*

·Create a plan of action: Based on research findings, develop a comprehensive strategy for alcohol detection and intervention.

·Design projects or programs: Implement initiatives such as public awareness campaigns, alcohol detection technologies, or rehabilitation programs.

4.Assessment and Modification

·Continuously monitor and evaluate program results: Collect data on program effectiveness, such as reduced accidents or increased awareness.

·Modify tactics based on evaluation results and feedback: Adjust strategies to address emerging issues or improve program outcomes.

5. Sustainability Planning

·Develop long-term strategies: Ensure the continuation of alcohol detection and intervention efforts beyond the initial project scope.

·Secure funding and resources: Pursue grants, partnerships, or government support to maintain program operations and growth.

6. Reporting and Documentation

·Record project actions, results, and knowledge gained: Maintain detailed records of project activities, outcomes, and lessons learned.

·Share findings and best practices: Disseminate project results through reports, publications, or conferences to inform and inspire future initiatives.

By following this structured approach, the project can effectively address alcohol-related issues, improve road safety, and contribute to a healthier and safer community

2.9.2 PROJECT EXECUTION PLAN

Week 1: System Finalization (May 29–June 4)

May 29–31: Complete the hardware configuration.

If the parts need to be moved from the breadboard, firmly attach them to a permanent board.

Make sure every connection is strong and dependable for extended use.

June 1–4: Carry out extensive testing to guarantee system stability.

Check for robustness and long-term operation.

Week 2: June 5–11, Documentation and Packaging

June 5–7: Finish the project's paperwork.

Write a thorough user manual outlining how to set everything up and utilize it.

For future reference, annotate the code with comments and explanations.

June 8–11: Prepare the system for use by packaging it.

Make a finished prototype that is prepared for display.

Week 3: Last-Minute Planning (June 12–June 18)

June 12–14: Get your presentation ready.

Make presentation slides that describe the project's objectives, development strategy, and outcomes.

June 15–16: Get ready for a live show.

Prepare the demonstration and set up the system.

June 17–18: Have a practice run.

Make sure the demonstration and all of the parts are operating flawlessly.

Week 4: June 19–June 28: Final Product Demonstration

Final touches and last-minute modifications are made from June 19–21.

Take care of any last problems found during the test run.

June 22–23: Review internally.

To get feedback, show the system to a limited group of internal users.

June 24–25: Based on internal input, improve the demonstration and presentation.

Final product demonstration, June 26–28.

Show prospective customers and stakeholders the finished product.

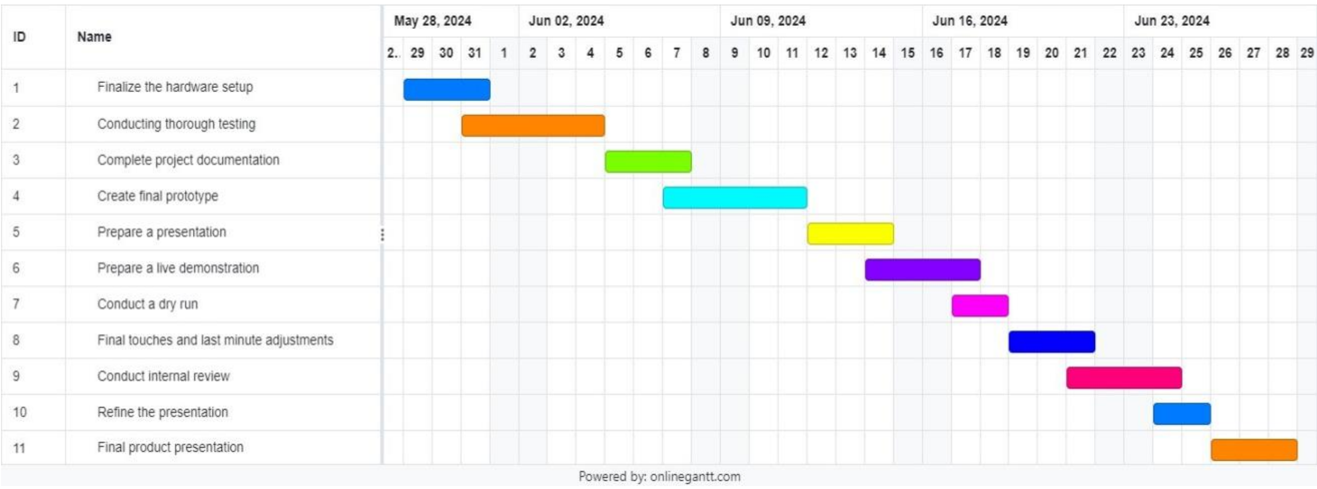


Fig 2.9,1 Gantt chart

CHAPTER 3

METHODOLOGY AND IMPLEMENTATION

CHAPTER 3

METHODOLOGY AND IMPLEMENTATION

The following is the design thought process for creating an alcohol sensing sensor with an engine lock system:

Empathize:

Comprehend the issue of intoxicated driving Determine the requirements and challenges faced by users (drivers, fleet managers, and car owners) Examine the shortcomings of the current solutions.

Define:

Explain the issue statement: "What steps can we take to prevent drunk driving and increase road safety?"

Determine the primary obstacles and necessities (precision, dependability, user-friendliness, etc.).

Ideate:

Come up with concepts for the hardware and software components of the sensor and engine lock system. Evaluate various technologies and methods (such as breathalysers and transdermal sensors).

Prototype:

Prototypes for the sensor and engine lock system should be made. They should then be tested and improved depending on user input and performance indicators.

Test:

Verify the final design through user testing, and make sure the system satisfies all requirements and effectively prevents drunk driving.

Implement:

· Create and implement the engine lock system and alcohol detecting sensor · Connect with cars and fleets

Iterate:

Keep an eye on and assess the system's functioning all the time. Obtain user input and make any necessary design updates.

An efficient alcohol detection sensor with an engine lock system is guaranteed by using this design thinking methodology, which promotes an iterative and user-centred design process.

3.1 HARDWARE REQUIREMENTS

1.Aurdino Uno

2.MQ3 alcohol sensor

3.Relay module 5v

4.Lcd 16x2

5.10k variable resistor

6.100R resistor -3

7.4.7k resistor

8.Green, Red LED

9.Buzzer

10.Male to male jump wires

11.Hard jump wire

12.Battery clip

13.Battery 9v

14.Solderless breadboard

3.2 SOFTWARE REQUIREMENTS

1.Aurdino IDE software

2.Embedded C Programming

3.Fritzing

3.3 FLOW DIAGRAM

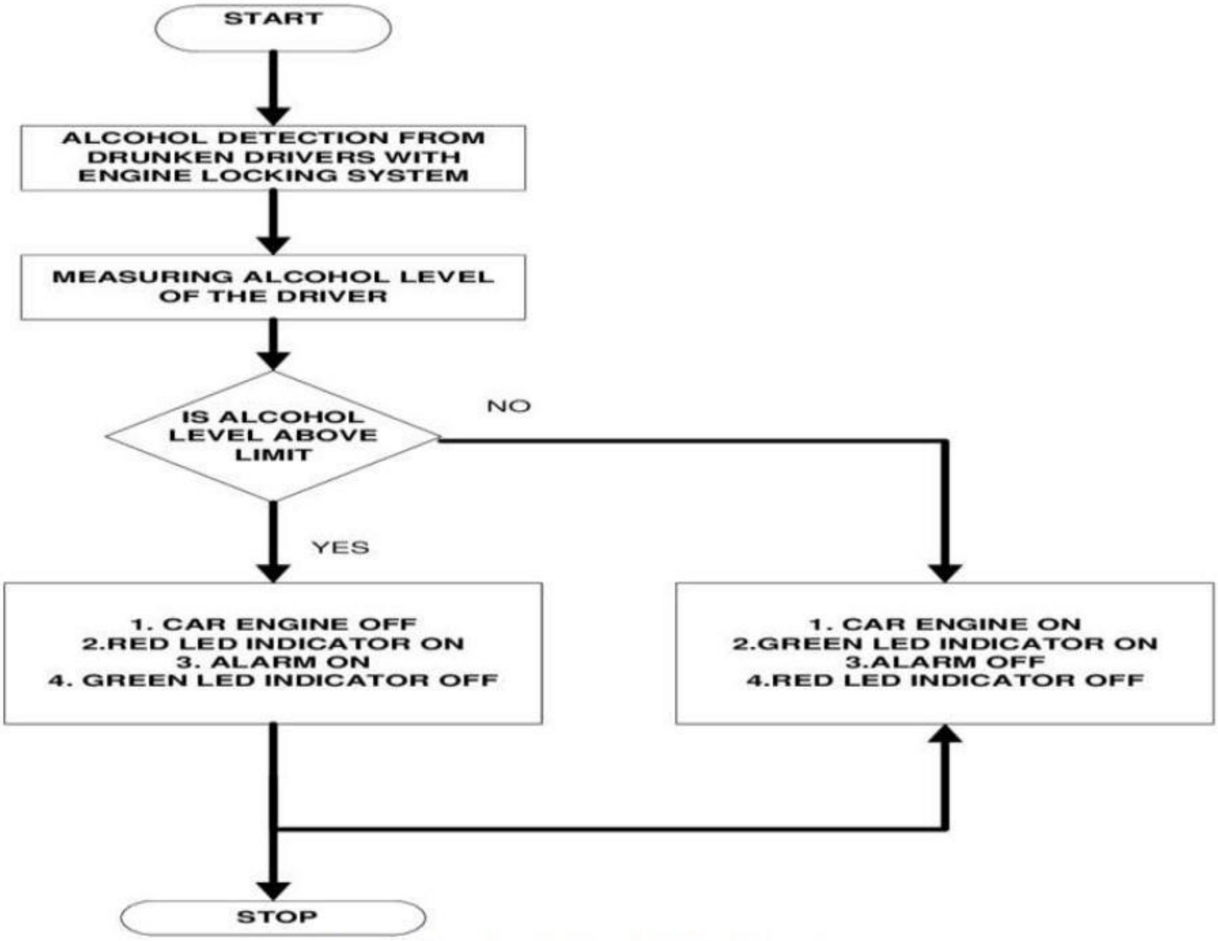


Fig. 4.Flow chart of alcohol detection system.

Fig 3.3,1 flow chart of alcohol detecting system

3.4 HARDWARE IMPLEMENTATION

1. Configure the MQ3 sensor.

Only four of the six pins on the MQ-3 sensor are normally used (A0, D0, VCC, and GND):

• Analog output (A0)

• D0: Digital output (for detection based on thresholds)

• VCC: 5V power supply, usually

• GND: Earth

2. Joining the Arduino with the sensor

Energize the Sensor:

Attach the MQ-3 sensor's VCC pin to the Arduino's 5V pin.

Attach the MQ-3 sensor's GND pin to the Arduino's GND pin. Read the Analog Output:

Connect the **A0** pin of the MQ-3 sensor to the analog input pin A0 on the Arduino.

Construct the Digital Output (optional, for detection based on thresholds):

Attach the MQ-3 sensor's D0 pin to one of the Arduino's digital pins, such as D2. If you wish to set off an alert when the amount of alcohol in the air beyond a particular level, use this pin.

3. Including LED and buzzer indicators

When alcohol is discovered, you can add buzzers or LEDs to offer feedback that is either visible or auditory. Attach an LED to an Arduino digital pin, then change the code so that it turns on when alcohol is detected.

Justification

• Analog Pin (A0): This pin measures the output voltage of the sensor, which is dependent on the amount of alcohol present.

• Threshold Value: To identify particular alcohol levels, modify this value in accordance with calibration.

• Optional LED Pin: Activates the LED upon detection of alcohol.

Testing and Calibration:

1. Calibration: Set the sensor in an environment with known alcohol concentrations and modify the threshold value in accordance with the sensor data.

2. Testing: To guarantee precise detection, test the system with different alcohol concentrations.

Combining Vehicle Systems with Integration

1. Integration of Hardware:

Engine Control Module (ECM) Interface: The sensor system is connected to the car's ECM. In order for the sensor to communicate lock/unlock signals to the engine, wiring and communication protocols are required.

Power Supply: Ensuring that the sensor system can operate dependably in a variety of situations and is fuelled by the car's battery.

3.5 SOFTWARE IMPLEMENTATION

Processing Data and Algorithms

1. Signal handling:

Filtering: To eliminate noise and unimportant signals, raw sensor data is filtered.

Calibration: The sensors are calibrated to guarantee accuracy in a range of individual variances and environmental circumstances.

2. Analysis of Data:

Development of Algorithms: Accurate algorithms are created to interpret sensor data. These algorithms take into consideration variables like skin temperature in touch-based sensors and breath volume in breath-based sensors.

Setting the Threshold: Safety and regulatory restrictions are taken into account while determining BAC thresholds. If these limits are surpassed, the engine lock mechanism is activated.

Combining Vehicle Systems with Integration

Integration of Software:

Firmware Development: To control the gathering, processing, and exchange of sensor data with the ECM, embedded software is built.

User Interface: A user interface is made to provide feedback to the driver. It can include alarms or displays that tell them of the status of the system and what has to be done, such retesting.

Front-End Code

The front-end code involves the LCD display, which provides feedback to the user based on the sensor readings. Here's the relevant part of your code that deals with the front end:

main.cpp Run Output Clear

```cpp
#include <LiquidCrystal.h>

LiquidCrystal lcd(8, 9, 10, 11, 12, 13); // RS, EN, D4, D5, D6, D7

void setup() {
  lcd.begin(16, 2); // initializing LCD
  lcd.setCursor(0, 0);
  lcd.print("Alcohol");
  lcd.setCursor(0, 1);
  lcd.print("Detection");
  delay(3000);
  lcd.clear();
  lcd.setCursor(0, 0);
  lcd.print("Press");
  lcd.setCursor(7, 0);
  lcd.print("key....");
  delay(1000);
}

void loop() {
  if (alc == HIGH) {
    lcd.clear();
    lcd.setCursor(0, 0);
    lcd.print(" Safe ");
    lcd.setCursor(0, 1);
    lcd.print("Drive... ");
    delay(2000);
    lcd.clear();
  } else {
    lcd.setCursor(0, 0);
    lcd.print("ALCOHOL");
    lcd.setCursor(0, 1);
    lcd.print("DETECTED");
    delay(1000);
    lcd.clear();
    lcd.setCursor(0, 0);
    lcd.print(" Press");
    lcd.setCursor(0, 1);
    lcd.print("key...");
  }
}
```

Fig 3.5,1 front end code

Explanation

Front-End (LCD Display):

Displays initial messages ("Alcohol Detection", "Press key...").

Shows "Safe Drive..." when no alcohol is detected.

Shows "ALCOHOL DETECTED" when alcohol is detected.

Back-End Code

The back-end code involves reading the gas sensor and controlling the relay and buzzer based on the sensor's output. Here’s the relevant part of your code that deals with the back end:

```
#define gas A0
#define buzzer 7
#define relay 6

int alc = 0;

void setup() {
  Serial.begin(9600); // initialize serial communications at 9600 bps:
  pinMode(gas, INPUT);
  pinMode(relay, OUTPUT);
  pinMode(buzzer, OUTPUT);
  digitalWrite(relay, HIGH);
  digitalWrite(buzzer, LOW);
}

void loop() {
  alc = digitalRead(gas);
  if (alc == HIGH) {
    digitalWrite(buzzer, LOW);
    digitalWrite(relay, LOW); // Unlock engine
    digitalWrite(buzzer, LOW);
  } else {
    digitalWrite(relay, HIGH); // Lock engine
    digitalWrite(buzzer, HIGH);
  }
}
```

Fig 3.5,2 back-end code

Explanation:

Back-End (Sensor and Control Logic):

Reads the gas sensor connected to pin A0.

Controls the relay and buzzer based on the sensor reading.

Locks the engine (relay HIGH) and sounds the buzzer (buzzer HIGH) if alcohol is detected.

Unlocks the engine (relay LOW) and silences the buzzer (buzzer LOW) if no alcohol is detected.

Complete Integrated Code:

```
#include <LiquidCrystal.h>
LiquidCrystal lcd(8, 9, 10, 11, 12,
13);//RS,EN,D4,D5,D6,D7
#define gas A0
#define buzzer 7
#define relay 6
int alc=0;
void
setup()
{
  Serial.begin(9600);       // initialize serial communications at 9600 bps:

pinMode(gas,INPUT);
  pinMode(relay,OUTPUT);
  pinMode(buzzer,OUTPUT);

digitalWrite(relay,HIGH);
  digitalWrite(buzzer,LOW);
  lcd.begin(16, 2);//initializing LCD

 lcd.setCursor(0,0);
  lcd.print("Alcohol");
  lcd.setCursor(0,1);

lcd.print("Detection");
  delay(3000);
  lcd.clear();
  lcd.setCursor(0,0);

lcd.print("Press");
  lcd.setCursor(7,0);
  lcd.print("key....");

delay(1000);
}
void loop()
{
 alc=digitalRead(gas);
 if(alc==HIGH)
 {

digitalWrite(buzzer,LOW);
    lcd.clear();
    digitalWrite(relay,LOW);

lcd.setCursor(0,0);
    lcd.print(" Safe ");
    lcd.setCursor(0,1);

lcd.print("Drive... ");
    delay(2000);
    lcd.clear();

digitalWrite(buzzer,LOW);
 }
 else
 {
  digitalWrite(relay,HIGH);

digitalWrite(buzzer,HIGH);
  lcd.setCursor(0,0);
  lcd.print("ALCOHOL");

lcd.setCursor(0,1);
  lcd.print("DETECTED");
  delay(1000);
  lcd.clear();

lcd.setCursor(0,0);
    lcd.print(" Press");
    lcd.setCursor(0,1);

lcd.print("key...");
 }
}
```

Fig 3.5,3 complete code

CHAPTER 4

RESULTS AND DISCUSSION

CHAPTER 4

Overview

By confirming that the driver is not intoxicated, alcohol detection and sensing technology in automobiles aims to prevent drunk driving. Alcohol levels can be found using a variety of techniques, such as breath analysis, touch-based sensors, and driving behavior monitoring.

Outcomes

Systems for Analyzing Breath:

Precision and Dependability: Vehicle-mounted breath analyzers have demonstrated a high degree of accuracy in determining the blood alcohol content (BAC). They make use of sensors that gauge the driver's breath alcohol content and compare it to permitted levels.

End Results and Talk

Systems for Behavioral Monitoring:

Utilization of Data: To determine possible impairment, these systems make use of movement data from the vehicle, such as lane deviation, abrupt braking, and unpredictable steering.

Machine Learning: The system's capacity to discriminate between sober and intoxicated driving behavior is improved by machine learning algorithms. Real-Time Alerts: The system can notify the driver and, in some situations, initiate safety procedures including reducing speed or calling emergency services when it detects impaired driving.

Effectiveness: There is hope that installing alcohol detection devices in automobiles will lessen the number of occurrences involving intoxicated drivers. The device serves as a disincentive and verifies that drivers are below permissible blood alcohol content levels before to operating a car. When ignition interlock devices are employed, studies and pilot programs have shown a significant reduction in the recidivism rates of people with a history of drunk driving

Final product

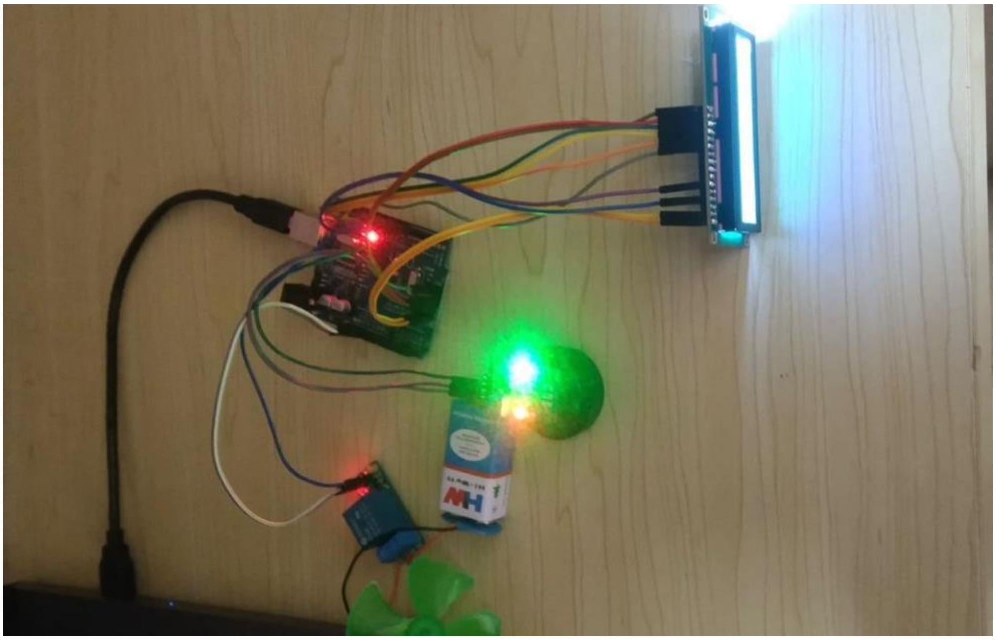


Fig 4.1 final product

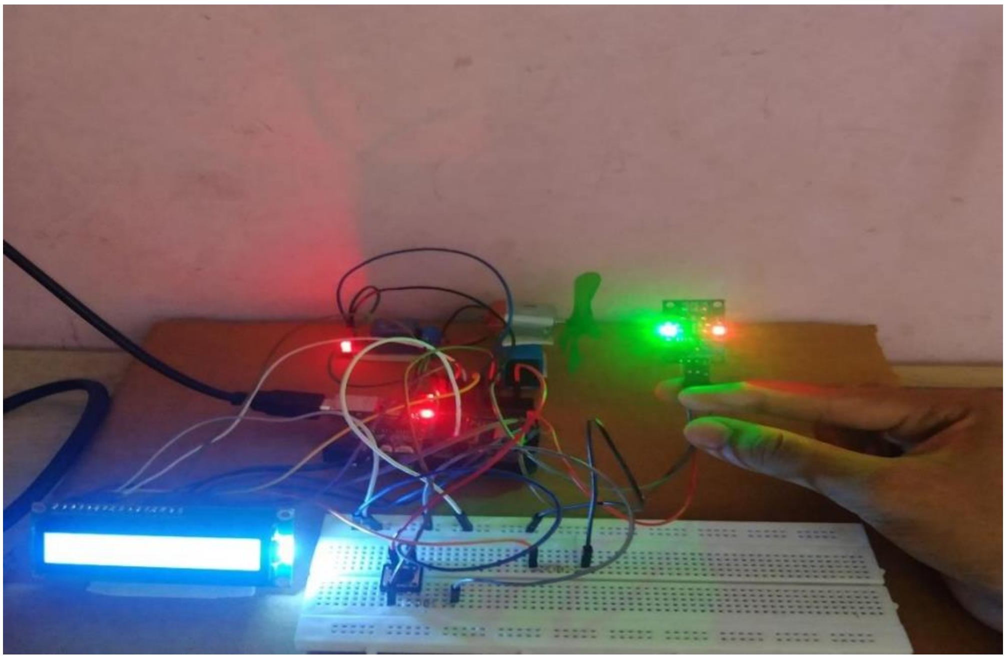


Fig 4.2 final product

Challenges:

Calibration and Maintenance: To guarantee the accuracy and dependability of the sensors, regular calibration and maintenance are necessary. In order to preserve accuracy, breath analyzers in particular require regular calibration.

Privacy Concerns: Privacy concerns are raised by the gathering and use of personal data, such as driving habits and blood alcohol content. To address these concerns, transparent policies and safeguards are required.

Legal and Regulatory Aspects: Governments and regulatory agencies are essential in enforcing laws requiring the use of alcohol detection devices. Recurrence of DUI offenses has been successfully decreased by laws mandating ignition interlock devices for offenders.

Technological Developments: It is anticipated that ongoing developments in data analytics, artificial intelligence, and sensor technologies will enhance the precision, dependability, and usability of alcohol detection systems.

Literature survey:

From the reference [4] & [5]

·Alcohol detection with engine locking using Node MCU can detect alcohol consumption and prevent accidents by not allowing the vehicle to start.

·Drowsiness and alcohol detection with engine locking can be achieved through a not-for-profit organization.

From the reference [6],[7] & [8]

·MQ-3 sensor can be used for alcohol detection and engine locking.

·Alcohol detection with engine locking system using GPS can be designed and implemented.

·Alcohol-Detected Engine Lock System (ADELS) can detect alcohol presence in a driver’s breath and trigger an automatic engine lock.

From the reference [9] & [10]

·Alcohol detection-based engine locking system using MQ-3 sensor can be installed in four-wheeled vehicles.

·Alcohol detection sensor can continually monitor alcohol consumption in drivers and turn off the engine if it exceeds the threshold level.

From the reference [11],[12] & [13]

·Alcohol detecting sensor with engine locking system can be designed using cheap hardware.

·Alcohol detection and engine locking system can be designed using Arduino Uno microcontroller attached to an alcohol sensor.

From the reference [14] & [15]

·Automatic engine locking system for drunken driving can be designed to detect alcohol content in a driver's breath.

·Alcohol detection and vehicle engine locking system using GPS and GMS technology can save lives and prevent injuries

CHAPTER 5

CONCLUSION AND FUTURE SCOPE

CHAPTER 5

CONCLUSION AND FUTURE SCOPE

Conclusion

Cars equipped with alcohol detection technologies have made great strides toward improving road safety and preventing drunk driving. The use of behavioural monitoring systems, touch-based sensors, and breath analyzers has shown promise in the identification and prevention of driving under the influence of alcohol. These devices serve as both deterrents and guarantees that drivers don't exceed the legal Blood Alcohol Content (BAC) thresholds before operating a vehicle.

Reduced recidivism rates among DUI offenders and an overall decline in alcohol-related accident events demonstrate the efficacy of these programs. Even with the obvious advantages, issues including user acceptability, privacy concerns, and the requirement for routine calibration must be resolved to guarantee widespread adoption and dependability.

This document explains how to create an intelligent vehicle system that uses the Arduino Alcohol sensor mq3 hardware platform, which is the heart of the hardware platform, to monitor multiple vehicle parameters over an extended period of time and transmit the collected data to the base unit. High reliability and low volume are advantages shared by the entire Control system. The system's future goals include lowering the number of accidents caused by drunk driving by checking accidents and providing helpful information about the involved car. This system shows to be a successful advancement in the automotive industry by adding innovation to the vehicles' current technology and enhancing safety measures.

Future Scope

The future scope of alcohol detecting sensors with engine lock systems is promising and far-reaching, with potential applications in:

1. Widespread adoption in the automotive industry: Integration into new vehicles as a standard safety feature, potentially becoming a mandatory requirement.

2. Retrofitting existing vehicles: Offering owners the option to install the system in their existing vehicles, enhancing safety on the road.

3. Commercial fleets and ride-sharing services: Implementing the technology in commercial vehicles to ensure public safety and reduce liability.

4. Advanced features and integrations: Incorporating additional sensors to detect other impairments, such as drugs or distractions, and integrating with emerging technologies like autonomous vehicles.

5. Expanded applications: Adapting the technology for use in other modes of transportation, like motorcycles, boats, or heavy machinery.

6. Enhanced user experience: Developing more user-friendly interfaces and feedback mechanisms to encourage responsible driving habits.

7. Data analytics and insights: Collecting and analysing data to identify trends, improve system performance, and inform road safety policies.

8. Global implementation: Collaborating with international regulatory bodies and automakers to deploy the technology worldwide.

9. Continuous improvement: Staying up-to-date with advancing sensor technologies and refining the system to maintain its effectiveness.

10. Contribution to a safer transportation ecosystem: Playing a vital role in reducing alcohol-related accidents and promoting a culture of road safety.

The future scope is vast, and as the technology advances, we can expect to see significant improvements in road safety and a reduction in alcohol-related incidents.

CHAPTER 6

OUR JOURNEY EXPERIENCE AND TAKE AWAY

CHAPTER 6

OUR JOURNEY EXPERIENCE AND TAKEAWAY

Student 1

I am A. Narendra Reddy from ISE 1. The journey of IDT and EE has been a skill building experience but overwhelming at the same time due to lack of insight of what needs to be done in order to achieve our aims. This taught us many important skills like leadership and team work which will be really helpful on the run. The lack of knowledge and experience in hardware circuit fixing and coding and lack of proper guidance and time allocation for proper execution of our project plan made it very stressful to reach the target on time. Overall, it was a good learning experience but not in a pleasing manner.

Since we were expected to independently learn the entire process of connecting the circuit and setting it up to developing the project, the time allocated for this entire process was very insufficient to effectively learn and execute our plan. Being 1st year engineering students who have not yet learned a single coding language completely, expecting them to self-learn hardware / code development and submit the project , their expectations were unreasonably elevated.

Fig 6.1 student one

Student 2

Myself Marilyn pious. T from ISE-2 This course has opened my eyes to a lot of fresh information. I have gained essential skills and approaches from this course that will help me think creatively and create ideas that successfully solve problems in the real world. I have also gained insights into the creative process and learned how to stimulate innovation. The course emphasized the importance of empathy in the design process. Understanding the user's needs, pain points, and desires became the foundation of my approach to problem-solving. Engaging with users through interviews and observations provided deep insights that informed the design process. It has also taught me the the importance of rapid prototyping and iterative testing. Building quick, low-fidelity prototypes allowed me to test ideas early and often, gather feedback, and make necessary adjustments. This iterative process ensured that the final solution was well-refined and aligned with user needs. The team work in this projecting making has helped me to build my leadership, team spirit, getting different opinions etc. The skills and insights gained from this course have enhanced my engineering exploitation, enabling me to create impactful, sustainable, and user-friendly solutions.

Fig 6.2 student two

Student 3

I am M. Satya Pravinya from Cse-AI. In innovative design thinking, the journey made me gain knowledge about many things here are few things I have learnt:

1.Understanding the problem - With the help of customer research we got to know about the real-life problems faced by the public and some improvement they needed which could help them. I also gained knowledge from experienced people in the industry. From the sustainable development goals, I also got to know how to solve a problem like ideation, prototyping etc.

2.Brainstorming- it also helped in thinking creative solutions to the problems

3.Taking feedback - After brainstorming and prototyping I learnt to take feedback from as many people as possible which helped me in the betterment of the project

4.Presentation -it also helped me to communicate my ideas effectively.

5.Teamwork- Our team included students from different branches which was an added advantage as we were expertise in our own domain. Since we are first year students, we also faced many difficulties due to the lack of knowledge. We had to learn a lot before coming up with the project. We also faced issues regarding the circuit connection which made us lose confidence yet we never gave up. Having a wonderful team helped me and bought the enthusiasm back.

Fig 6.3 student three

Student 4

I am kalyan from Electronic and communication engineering in engineering exploration has been a transformative experience, marked by both technical discoveries and personal growth. Throughout this journey, I've encountered complex problems that pushed me to think innovatively and apply theoretical knowledge in practical settings. One of the most valuable lessons was understanding the iterative nature of engineering, how failures are opportunities to learn and refine solutions.

Collaboration has been an experience. Working alongside with team taught me the power of collective intelligence and the ability to leverage different perspectives to solve challenges effectively. This not only enhanced the quality of our outputs but also fostered a sense of mutual respect.

Moreover, engineering exploration reinforced the importance of adaptability and resilience. Projects often required quick adjustments in strategies or approaches based on new data or unforeseen obstacles. This flexibility was crucial in maintaining progress and achieving project milestones.

finally, engineering exploration is not just about technical skills but also about personal growth, ethical considerations, and contributing positively to society through innovation and problem-solving. It prepares us to tackle complex challenges with creativity, resilience, and a commitment to lifelong learning.

Fig 6.4 student four

REFERENCE

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Link:

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[3] Sarvottam N Katti, Sourabh S Sirsi, Vandana Prakash, BU Vinith Raj, and Vandana Jha. Talking gloves: sign language to speech conversion for deaf and mute person. J Univ Shanghai Sci Technol, 23(9), 2021.

Research and article papers

[4] Research: A Lightweight In-Vehicle Alcohol Detection Using Smart Sensing and Supervised Learning

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[5] Research on "Preventing Drivers From Starting Their Cars After Drinking Alcohol"

Link:https://www.winsen-sensor.com/knowledge/alcohol-detection-engine-lockin-to-prevent-drunk-driving.html#:~:text=Actually%2C%20alcohol%20lock%20to%20prevent

[6] Article on "A Breath Sample Testing-Based Driver Alcohol Detection System"

Link:https://dadss.org/breath-technology/#:~:text=Molecules%20of%20alcohol%20and%20those,accurately%20calculate%20the%20alcohol%20concentration

[7] Article on "A Portable Alcohol Detection System"

Link: https://ieeexplore.ieee.org/document/7575207

[8] Research paper on “Vehicle-Based Alcohol Detection System”

Link:https://auctoresonline.org/article/significance-of-alcohol-detection-systems-in-vehicles#:~:text=In%2Dvehicle%20alcohol%20detection%20using,Blood%20Alcohol%20Content%20(BAC)

[9] Review Paper On “A Non-Invasive Approach for Detecting the Presence of Alcohol Within a Vehicle”

Link: https://www.mdpi.com/1424-8220/24/7/2252

[10] Research Paper On” Alcohol Consumption Prediction”

Link: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9914951/

[11] Research paper on:” Low-Cost, Non-Intrusive Real-Time Driver Drowsiness Detection System”

Link: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8309856/

[12] Research Paper On : “Case-Based Reasoning System to Detect Alcoholic State”

Link:https://www.mdpi.com/2073431X/11/8/121#:~:text=Four%20physiological%20measures%20are%20used,rate%2C%20and%20heart%20rate%20variability.

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Link: https://www.ijetajournal.org/volume-2/issue-2/IJETA-V2I2P14.pdf

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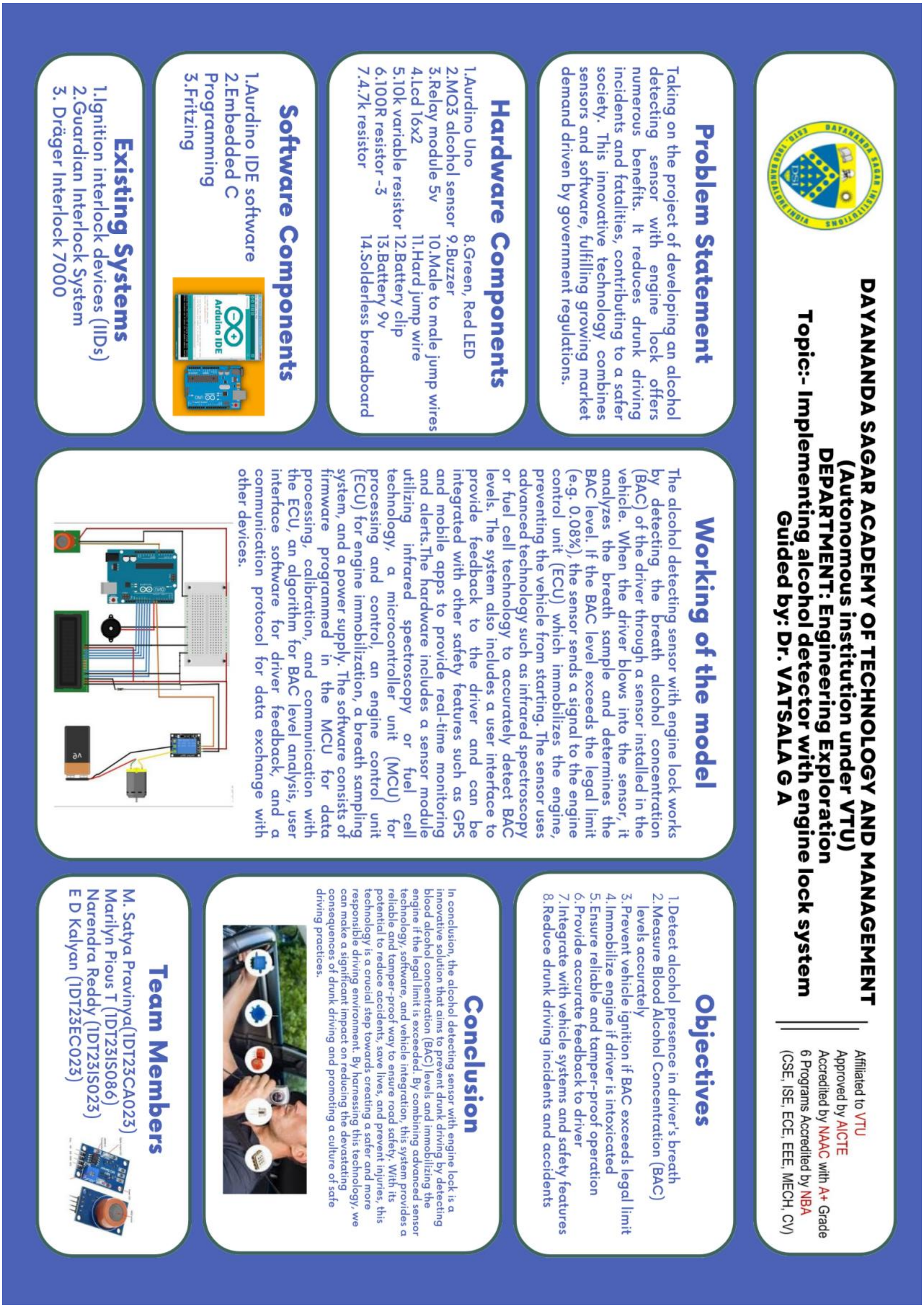
Link: https://www.mdpi.com/2073-431X/11/8/121

[15] Research on :” Binary Confusion Matrix Analysis for Alcohol Detection”

Link: https://www.mdpi.com/2073-431X/11/8/121

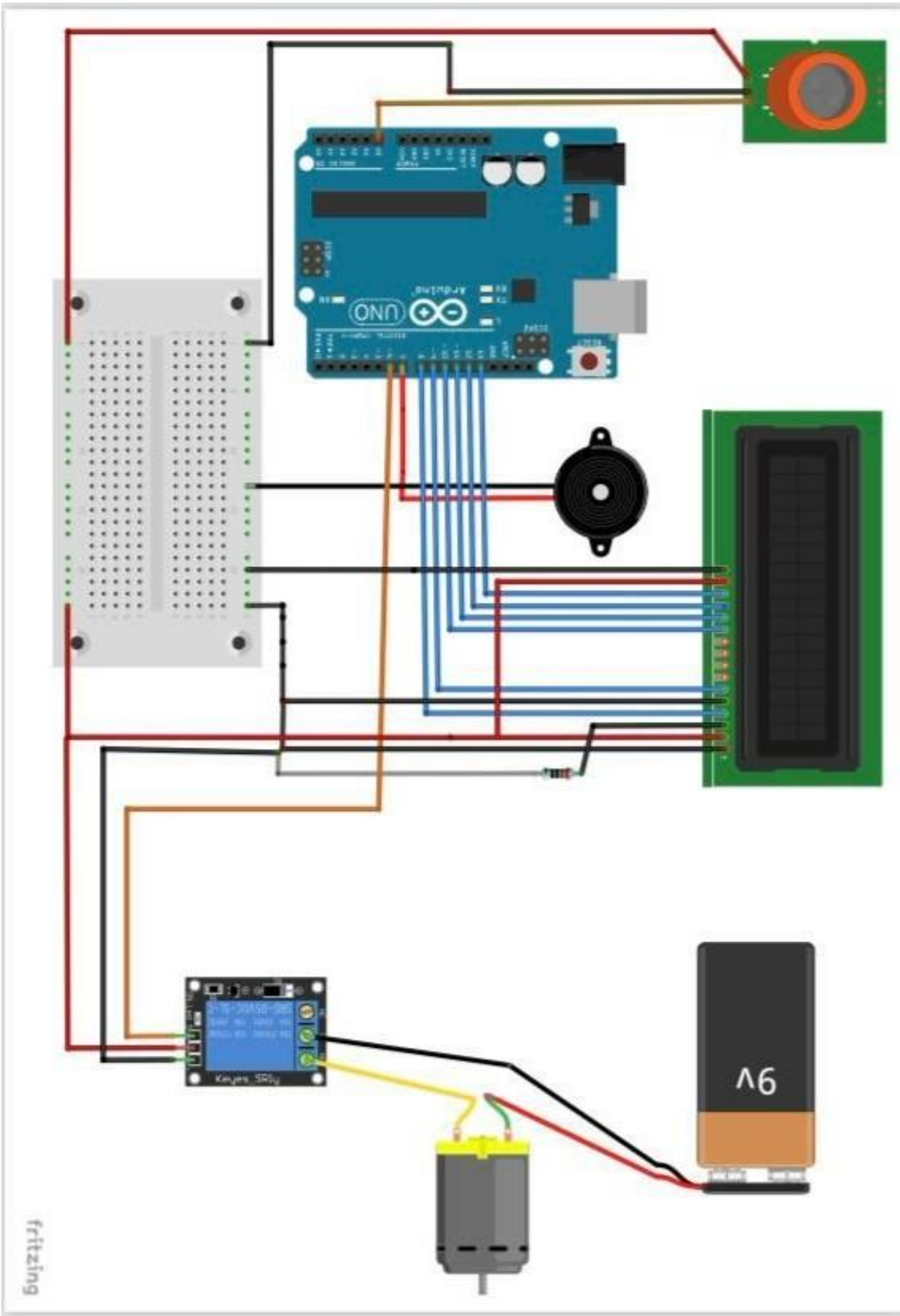
ANNEXURE I



DAYANANDA SAGAR ACADEMY OF TECHNOLOGY AND MANAGEMENT
(Autonomous institution under VTU)
DEPARTMENT: Engineering Exploration
Topic:- Implementing alcohol detector with engine lock system
Guided by: Dr. VATSALA G A
Affiliated to VTU
Approved by AICTE
Accredited by NAAC with A+ Grade
6 Programs Accredited by NBA
(CSE, ISE, ECE, EEE, MECH, CV)
Problem Statement
Taking on the project of developing an alcohol detecting sensor with engine lock offers numerous benefits. It reduces drunk driving incidents and fatalities, contributing to a safer society. This innovative technology combines sensors and software, fulfilling growing market demand driven by government regulations.
Hardware Components
1.Aurdino Uno
2.MQ3 alcohol sensor
3.Relay module 5v
4.Lcd 16x2
5.10k variable resistor
6.100R resistor -3
7.4.7k resistor
8.Green, Red LED
9.Buzzer
10.Male to male jump wires
11.Hard jump wire
12.Battery clip
13.Battery 9v
14.Solderless breadboard
Software Components
1.Aurdino IDE software
2.Embedded C Programming
3.Fritzing
Arduino IDE
Existing Systems
1.Ignition interlock devices (IIDs)
2.Guardian Interlock System
3. Dräger Interlock 7000
Working of the model
The alcohol detecting sensor with engine lock works by detecting the breath alcohol concentration (BAC) of the driver through a sensor installed in the vehicle. When the driver blows into the sensor, it analyzes the breath sample and determines the BAC level. If the BAC level exceeds the legal limit (e.g. 0.08%), the sensor sends a signal to the engine control unit (ECU) which immobilizes the engine, preventing the vehicle from starting. The sensor uses advanced technology such as infrared spectroscopy or fuel cell technology to accurately detect BAC levels. The system also includes a user interface to provide feedback to the driver and can be integrated with other safety features such as GPS and mobile apps to provide real-time monitoring and alerts.The hardware includes a sensor module utilizing infrared spectroscopy or fuel cell technology, a microcontroller unit (MCU) for processing and control, an engine control unit (ECU) for engine immobilization, a breath sampling system, and a power supply. The software consists of firmware programmed in the MCU for data processing, calibration, and communication with the ECU, an algorithm for BAC level analysis, user interface software for driver feedback, and a communication protocol for data exchange with other devices.
9V
Objectives
1.Detect alcohol presence in driver's breath
2.Measure Blood Alcohol Concentration (BAC) levels accurately
3.Prevent vehicle ignition if BAC exceeds legal limit
4.Immobilize engine if driver is intoxicated
5.Ensure reliable and tamper-proof operation
6.Provide accurate feedback to driver
7.Integrate with vehicle systems and safety features
8.Reduce drunk driving incidents and accidents
Conclusion
In conclusion, the alcohol detecting sensor with engine lock is a innovative solution that aims to prevent drunk driving by detecting blood alcohol concentration (BAC) levels and immobilizing the engine if the legal limit is exceeded. By combining advanced sensor technology, software, and vehicle integration, this system provides a reliable and tamper-proof way to ensure road safety. With its potential to reduce accidents, save lives, and prevent injuries, this technology is a crucial step towards creating a safer and more responsible driving environment. By harnessing this technology, we can make a significant impact on reducing the devastating consequences of drunk driving and promoting a culture of safe driving practices.
Team Members
M. Satya Pravinya(1DT23CA023)
Marilyn Pious T (1DT23IS086)
Narendra Reddy (1DT23IS023)
E D Kalyan (1DT23EC023)

ANNEXURE II

Visual circuit connection of the product



About the working of the components used:

- DC motor: - Normally the DC motor is running. At that moment, the green LED is on and the alcohol% is below 40. But when the alcohol% rises above 40, the motor stops and the red LED lights up
- MQ3 sensor: - We used ethyl alcohol to demonstrate our project. In this project the MQ 3 sensor is used as an alcohol sensor. It senses % ethanol molecule. When the ethanol % rises above the specified value, then it will give a signal to the Arduino.
- Arduino Board: - This is an embedded system which we have used to control the entire section. According to the signal from the MQ3 sensor, it controls the operation of the DC motor. It also controls the LCD display module.
- Darlington Pair: - Here Darlington pair is used to increase the rated current to run the DC motor.
- No-load diode: - We have used a no-load diode across the DC motor to reduce the inductive effect.
- LCD Display: - Here we have used LCD display to display the percentage of alcohol.

ANNEXURE III

DrillBit

The Report is Generated by DrillBit Plagiarism Detection Software

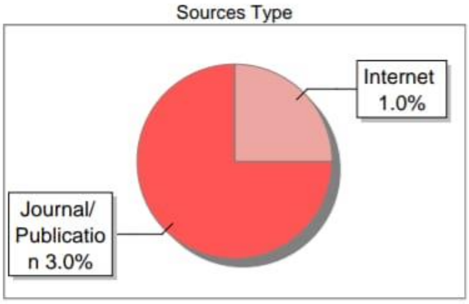
Submission Information

Author Name	A.narendra reddy Ise_1 1DT23IS023 report 1
Title	ALCOHAL SENSING AND ENGINE LOCKING SYSTEM
Paper/Submission ID	2073519
Submitted by	library@dsatm.edu.in
Submission Date	2024-07-02 15:20:40
Total Pages, Total Words	53, 8986
Document type	Project Work

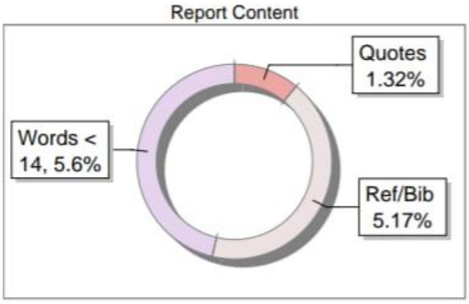
Result Information

Similarity **4 %**

Sources Type



Report Content



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Quotes	Excluded
References/Bibliography	Excluded
Source: Excluded < 14 Words	Excluded
Excluded Source	**0 %**
Excluded Phrases	Not Excluded

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Student Papers	Yes
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Institution Repository	Yes

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