



Literature Survey on Authenticated Access Control for Vehicle Ignition System by Driver's License and Fingerprint Technology

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Abstract: *One of the most widely used and trustworthy forms of personal biometric identification is fingerprint identification. We are able to stop those without licenses from operating a vehicle and causing collisions by utilizing this biometric authentication. The suggested method comprises of a smart card that can store a specific individual's fingerprint. The license holder's fingerprint must be recorded on the card at the time of issuance. Cars and other vehicles ought to be equipped with a card reader that can scan a license. The fingerprint reader device should be installed in the same car. If a person wants to operate the car, they must first swipe their finger after inserting their smartcard. The system moves on to alcohol detection and helmet verifying if the fingerprint matches the fingerprint that is saved on the smart card. The car will start once all authentications have been completed. If any of the authentications are unsuccessful, the car won't start and won't move on to the next phase. This makes cars more secure and guarantees safe driving by averting collisions. The Master controller uses the ignition system prototype. (Cortex M3 based Micro controller) is created and executed in conjunction with the vehicle prototype, with the accompanying outcomes.*

Keywords: *Smart card reader, Fingerprint module, Alcohol sensor, Helmet detector*

I. INTRODUCTION

In many nations, driving without a license is a serious problem. According to the survey, drunk drivers, unlicensed drivers, and drivers who don't wear helmets are the main causes of accidents. India has a high accident rate because to dangerous driving conditions. 84,674 road accident deaths were reported from India alone in 2002, out of around 11.8 lakh road accident deaths worldwide, according to WHO figures. To 92,618 fatalities in 2004 was the higher figure. Comparing India to the UK, Sweden, the Netherlands, and Japan, the mortality rate is 8.7 per 100,000 people, while it is 5.6 in the UK, 5.4 in Sweden, and 6.7 in Japan. Compared to affluent countries where the incidence is less than two, India has a fatality rate of up to 14 per 10,000 automobiles. In India, 1,10,300, 1,05,725 and 1,54,600 deaths are projected for the years 2005, 2006, and 2014. In the previous way, the car was started with keys. Vehicles that are taken using this manner are not able to stop accidents.

Many smart systems are made to warn the owner as soon as the car is lit in order to avoid vehicle theft. Numerous writers have put forth various systems, which are summarized in the literature review.

II. LITERATURE SURVEY

Hardware module combinations for the Electric Vehicle Intelligent Control System [1]. The Electric Vehicle Intelligent Control System (EVICS), a 2-in-1 system for an electric vehicle (EV) that includes an infotainment system for the back seat passengers and a monitoring system for the front seat driver, is employed by the author in this study article. The battery voltage, current, and temperature monitoring modules, the battery energy status (%), the remaining mileage (kilometers), the speed (km/h) and rpm meter, the offline and online Global Positioning System (GPS), and the Contour Positioning System (CPS) make up the monitoring system. Inadequate processing capacity for intricate control tasks in hardware configurations is the primary flaw in this work.

An sophisticated climate control system for automobiles [2] This study describes the development of an intelligent car climate control system based on human-sensory response. To increase the occupant's perceived thermal comfort, the system makes use of an intelligent controller and a passive remote infrared sensor to assess the skin temperature of the vehicle occupant. A range of skin temperatures that are agreeable in various climates is what defines thermal comfort. To maintain the appropriate degree of thermal comfort, the controller keeps an eye on and adjusts the air and skin temperatures. In addition to strengthening the controller's resilience, the new technology provides the framework for a completely autonomous climate control system that requires little to no human involvement. The main drawback of this paper is Limited adaptability to diverse user preferences in sensory-based control system.

Thermoelectric devices are used in a smart temperature-controlled newborn car seat [3]. It is discussed in the research work that thermal comfort for adults and children in cars is an important issue, and that it should be improved because hot weather can make people agitated and uncomfortable. Prolonged exposure to high temperatures inside an automobile might cause serious health issues. The thermal comfort of newborns is the main topic of this paper. An infant vehicle seat cannot be effectively cooled by air conditioning systems because of its portability and cooling time. This work investigates the use of a thermoelectric cooling system for kid heat relief. This essay examines a wide range of topics related to the creation of temperature-regulated baby car seats. The health and safety of children in cars, parent's subjective needs, heat management in the car cabin, thermoelectric modeling, and techniques for accurate temperature control for efficient thermoelectric cooling are the main topics of this study. This paper's primary flaw is its scant real-world safety validation and reliance on simulation to determine efficacy.

Smart Vehicle Ignition and Monitoring System powered by the Internet of Things [4]. As a result of technological breakthroughs, automakers everywhere are introducing a number of clever improvements to expand their range of products. These can range from putting basic solutions like navigation systems into place to more sophisticated ones like driver assistance systems, which can then monitor several aspects of the car in order to help the driver. This essay focuses on one such driver assistance system that not only alerts the driver to the condition of their vehicle but also provides further security measures to deter auto theft. In addition to suggesting a method to stop the car from starting if the driver has consumed alcohol, the paper also includes an emergency alarm system in case of an accident. This paper's primary flaw is that it may have security holes that leave vehicle control vulnerable to online attacks.

The replacement of keys with biometric lock systems, particularly fingerprint-based ones, is the main topic of Omidiora E.O. et al.'s paper [5]. This is because fingerprints are the most established and commonly used form of biometric identification and also offer a strong security mechanism for a variety of security domains. Their prototype is made up of an ignition system module for starting the car, a hardware unit for

interacting, and a fingerprint software module for storing the database of authorized users. The module contains the database of authorized users. The PC parallel port is used to operate external devices (hardware). An easy-to-use and reasonably priced tool for creating computer-controlled projects and gadgets is the parallel port. It is frequently utilized in Atmel/PIC programmers and computer-controlled robots. Visual Basic, Visual C, and Visual C++ can all be used to program. The written device driver is then made to connect with the user mode program. This prototype was programmed using Visual Basic 6.0 Enterprise Edition. Twenty test photos that were kept in the database were used to test the prototype. The controller was able to distinguish between the real user and the fake user, and the results were successful. Based on the minutiae extraction, the recognition software was able to differentiate between test images of high, medium, and low quality. When there is a mismatch, logic 0 is transferred, and logic 1 is transferred in the matched case. This paper's primary flaw is its vulnerability to spoofing or fake acceptance, which jeopardizes security integrity.

The document is titled [6]. Since each person's fingerprints are unique, the focus of his study is on fingerprint security. To add or remove a legitimate user from the module, a keypad is also utilized. This is accomplished by using the NITGEN FIM3030 fingerprint module. The entire drive unit is controlled by the microcontroller AT89C52. A display unit called an LCD is used to present data on both authorized and illegal users. Because the DM742S138 decoder has a short propagation delay, it is useful for data routing and interface with fast memory units. The high-speed Si-gate CMOS latch 74HC373 is utilized. A relay serves as an interface circuit between the car's ignition system and microcontroller output. Due to restrictions on spark plug initiation and safety concerns, a prototype is the only one whose success is contingent upon the car battery starting. This paper's primary flaw is its limited storage capacity for various fingerprint templates, which limits the scalability of the user.

This document [7] offers practical and efficient methods for securing a two-wheeled vehicle by utilizing a variety of the vehicle's locking options. Instead of using the idea of biometric identification, this project offers additional security features that can be used to track down the vehicle in the event of theft. It also gives the bike owner access to the vehicle's current location. Fuel is isolated from the ignition system using an alarm device and engine immobilizer. Text message service for controlling and alarming device: The owner can use the SMS service to fully lock the car and receive alerts about when the bike is turned on. Remote Keyless System, or RKS, is another tool for remotely locking the car. The SIM number serves as the vehicle's master key in this project's RKS system. The project also makes use of side stand alert. In order to prevent any driver injuries, it alerts the user when the side stands are lowered after the car is started. ATMEGA-328 microcontroller is used in the project. Programming code is written in the Arduino IDE (Integrated Development Environment) v 5.2. The hardware module was tested on different models of two-wheeler vehicles. The module is made in such a way to optimize the cost because increasing the cost of the module can directly increase the cost of the vehicle.

This paper [8] makes use of multiple existing models that are being applied separately. Each of these models is applied as an individual unit. The owner can examine the frequently updated database containing the data gathered from these models. As a result, this system offers additional driver-related information. During the payment periods, the driver's background might be confirmed. Additionally, this project's addition of data security, which uses the SHA-1 and SALT algorithms to protect the system from hackers, is more beneficial. Additional features can be added the suggested system, which would then help with government transportation

An embedded vehicular speed detection system that is both affordable and effective is provided in this study [9]. The paper compared current approaches, including FFT, DSP, and LASAR-based methodologies, in an effort to produce superior results. When there were no other moving items in the nearby area, the output was more accurate. When the car is not moving, the radar will actually not be able to determine its true velocity.

An overview of various methods for vehicle speed detection is provided in this publication [10]. Various methods include centroid method, absolute method, motion vector technique, edge extraction, object tracking, and background picture subtraction. In MATLAB, the processing is carried out. Any of these techniques can be used to maintain vehicle speed detection and control traffic.

Using lidar data from roadside locations, this work proposes an integrated vehicle tracking framework [11]. In the first case, vehicle clusters were identified using a three-step schema from the raw point clouds. Following that, a tracking process based on centroid identification was used to determine clusters for every vehicle.

One of the most important issues with VDs used to collect traffic data for an ITS is estimating and categorizing vehicle speed [12]. On the other hand, per-vehicle speed estimation using side-looking single-beam microwave detection is often unsupported or erroneous, as mentioned in Section I. Furthermore, the noisy speed estimations from standard data aggregation for single beam detectors make it hard to obtain trustworthy length data from these detectors.

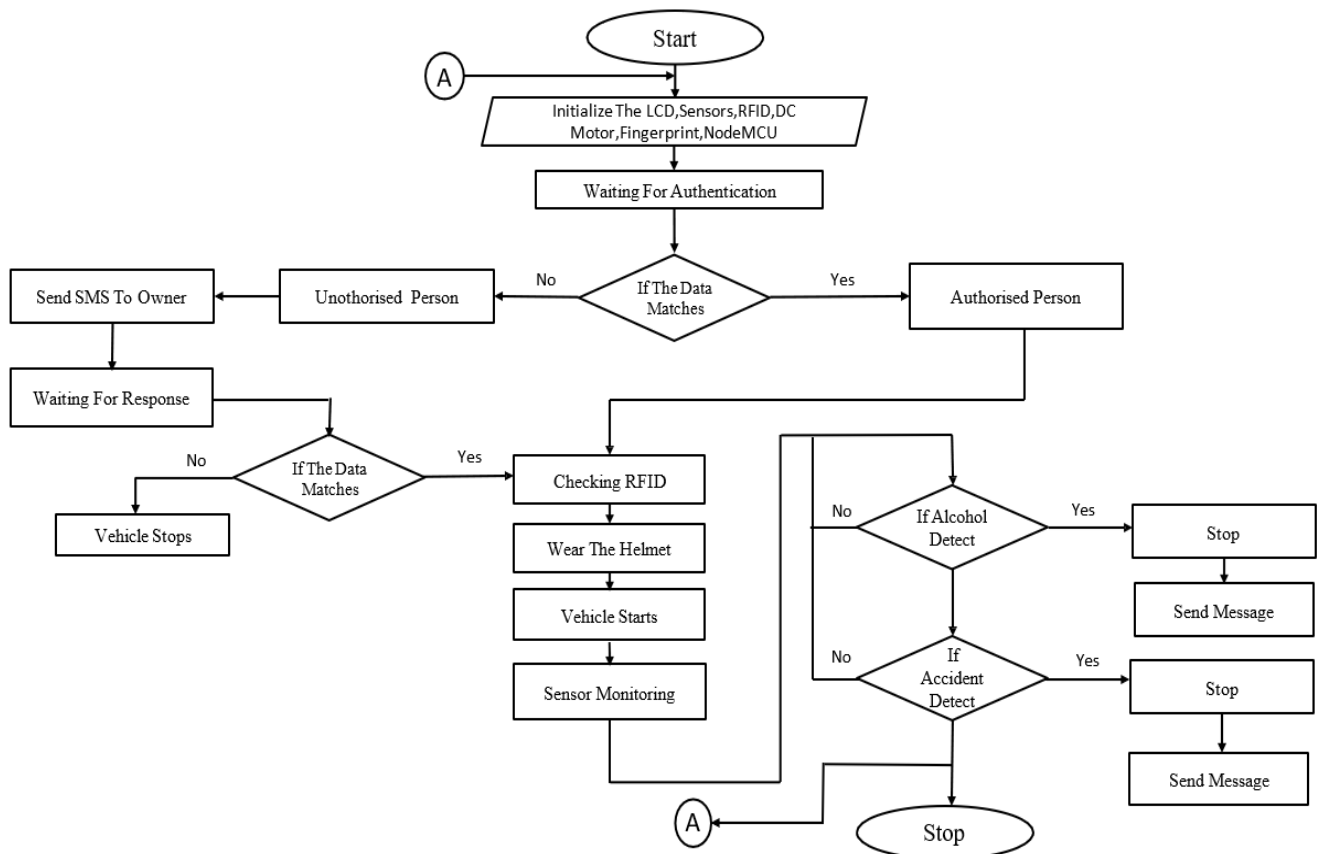
The author of this research [13] examined a variety of technologies, including laser light systems, average speed computers, vision-based systems, and radar-based technologies, that are used to identify speed violations. Each of them has issues such as poor accuracy, inability to function in poor weather or low light, high cost, limited range, line of sight, difficulty focusing on a specific vehicle, etc. Therefore, in order to compute the average speed for various vehicle kinds, we need a system that can be run automatically with acceptable precision, function even in poor weather and lighting conditions, and uniquely identify the vehicle with its type.

The subject matter of this study [14] is video surveillance systems. Numerous fields can benefit from the implementation of these technologies, including robotics, object recognition, accident and fire detection, and premises security. In these systems, the media that is handled is video. Motion detection is one of the most crucial phases in video surveillance systems. In this step, moving objects in video clips that the security camera recorded are identified. In the subject of video analysis, the motion detection stage is one of the most researched problems with numerous research papers focusing on it.

Vehicle Anti-Theft Device The GPS module, which is based on GSM, allows for online vehicle location observation, high-sensitivity response, and remote monitoring [15]. The system combines the conventional car warning system with good security features. The system has the potential to grow and incorporate new features, such Internet of Things. Thanks to the adoption of the NRF24L01 module, the system can accomplish networking between two or more cars.

In order for other cars to be aware of the warning in the event that one car alarms. Finding the missing car is a wonderful thing.

III.FLOW CHART



IV.OBJECTIVES

- The few drawbacks of literature survey paper will be our objectives.
- objectives which we have solved or addressed in our project.

V.PROPOSED METHOD

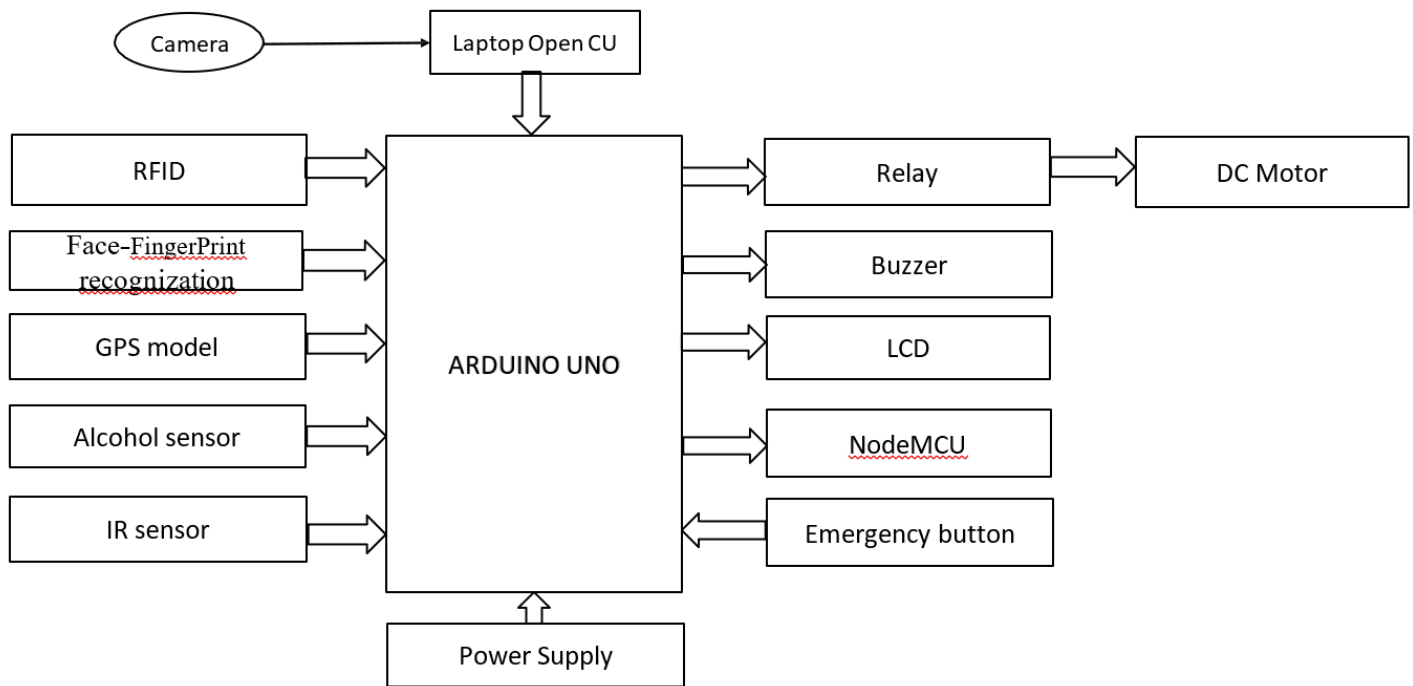
The smart card used in the proposed system is a driver's license that has the ability to store a fingerprint. The license holder's fingerprint must be recorded on the card at the time of issuance. First, the individual needs to produce their fingerprint and insert their smart card (driver's license). The system moves on to alcohol detection and helmet verifying if the fingerprint matches the fingerprint that is saved on the smart card. An alcohol detector checks a person to see if they are intoxicated or not. The helmet detector asks and confirms that the wearer is wearing a seatbelt.

The car will start once all authentications have been completed. If any of the authentications are unsuccessful, the car won't start and won't move on to the next phase. If a driver's license has even one of the following problems, the smart card reader will not accept it.

- If the driving license validity is expired.
- If the driving license card is a learner license.
- If the driving license card is blocked.

The proposed blocks diagram is as shown below

VI. BLOCK DIAGRAM



VII. CONCLUSION

I hope to draw the conclusion from this paper that the approach we have in mind will increase security and deter car theft. No one will be able to use another person's driver's license or drive without one thanks to this system.

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