BIOMETRIC BASED MOTORBIKE IGNITION STARTER USING ARDUINO

Krish Sharma*1, Pranav Wakhare*2, Yash Bhalerao*3,
Prajwal Tulawe*4, Prof. T.R. Shinde*5

*1,2,3,4 Student, Department of Information Technology, Pimpri Chinchwad Polytechnic, Pune.
*5 Lecturer, Department of Information Technology, Pimpri Chinchwad Polytechnic, Pune.

ABSTRACT

In this survey paper, we have described our detailed study that we have done for our project. We will be using fingerprint Arduino sensor to design a bike starter which will ignite motorbikes engine by scanning the fingerprint of user and then comparing it with the pre-installed fingerprints present in the database. Biometric traits are unique to each person and are very difficult for anyone to fake them. A person’s traits are always carried by him, where he is physically present. Fingerprint authentication is an efficient system, unlike key-lock system, where the key can be lost or cloned or they can use a master key.

Keywords: Biometric, Digital Lock, Safety, Motorbike.

I. INTRODUCTION

Biometrics is the use of measurements, biological features such as fingerprints or iris patterns to identify a person in an electronic system. Once these measures are taken, they can be used to authorize the individual or user. This is done by a pre-registered biometric trait compared to a pre-recorded template. By an increasing number in data of fingerprint samples, it soon became fascinating to have an efficient manner of distinguishing images of fingerprint and using it for security purpose.

This system allows scanning and storing fingerprints of each individual. The fingerprint sensor is one of the finest programmed modules, as it can distinguish every individual at a very low rate of mistake. Digital locks are implemented in wagons previously. The type of fingerprint scanning module we will practice is the R307 fingerprint module. Basically, we will change the traditional method that is used to start a motorbike. Here, the connection forwarded to the ignition switch will supply voltage to the voltage regulator and then to the module to decide that whether the motorbike should be started or not. With a time span of 10 seconds, the scanner will scan the finger placed on the R307 fingerprint module and then, if the scanned fingerprint image is allowed by comparing it to the pre-installed database of fingerprint images the module will send a positive signal accordingly and it will activate the relay which connected to the starter of vehicle and thus, the vehicle will start.

If the fingerprint is not detected by the sensor or if the collected sample at the initial stage of fingerprint scanning for authorization is not similar to any of data present in the database, the module will not send any kind of single and no further moment will happen that is required to start the engine of the motorcycle.

II. LITERATURE RESEARCH

Fingerprints are being studied carefully for many years. The study of traits of fingerprints was seen early in the 1600s. Later, using biometrics as a means for identification for an individual first occurred in the mid-1800s. In Egypt, thousands of years ago, it was common for people to use physical features or features such as scars, eye and hair color and height to identify people for business. Biometrics is a rapidly strengthening technology which is widely used in technologies such as crime detection and prison security, and has the potential to be widely accepted at a very wide range. It has become commonplace to see fingerprints installed on various devices, and their installation in cars is not surprising. In cars they install these scanners as a safety feature where the car owner does not need the car keys to open the doors or start the engine. This is made for the vehicle security purpose as the thief could not start the car without taking the time to hot-wire the car which requires time. In large government agencies and companies, biometrics plays a major role in employee identification and safety. In addition, some data centers have accessed the bandwagon and used biometric scanners to enhance remote access by adding another layer of system security for system administrators. Unfortunately, the cost of using
fingerprints and other biometric security scans on data centers is still very expensive, and many institutions still rely on ID badges while waiting until biometric technology becomes much easier.

Here, we also studied some existing systems;

According to paper [1] [Vehicle starting system using fingerprint], the work performed had a well-operated prototype of a fingerprint based vehicle staring system. This system’s intelligent agents could communicate well, and it gives output under user input. This system requests for user's finger, process it and give output based on if the finger they stored in the fingerprint modules database has a match of it. The system could also enroll new user’s finger at request but prompt for passcode before they could register it. Hence, the fingerprint technology improved the security of an automobile, making it possible for only allowed users to use the car. Therefore, implementing this system on vehicles makes the achievement of our car security system comes in a cheap and easily available form. Expected output was observed in their paper.

In paper [2] [Development of vehicle ignition using fingerprint], the project's aim was to develop a vehicle ignition using fingerprint, and that they had successfully developed. In a nutshell, they successfully developed their prototype of vehicle ignition using the fingerprint scanner. This system operates fine regarding enrolling new users and deleting the registered users. Successful steps were taken to notify the allowed user via SMS using GSM in their project. SMS’s were sent to the owner when the vehicle was turned on and when an unauthorized user was detected a theft alarm from the buzzer, a notification to the owner's mobile phone via GSM SIM 900 and status display on the LCD was shown also the vehicle motor was not started. It displayed the status of the user and the expected output was observed. Here LCD displays the status of the vehicle when the vehicle is on, ready to start, and fingerprint’s condition. It revealed the output of this system through LED and to the motor owner. This fingerprint technology was focused on automobiles and it only allowed registered users to use it. Implementing this system on locally manufactured vehicles will make the car security system secure, which will be also cheap.

In this paper [3] [Development of Fingerprint Engine Starter], the primary purpose of their study was to know about the development of electric engine starter into a fingerprint-based engine starter to enhance and create a high security on motorbikes and scooters which were commonly used by students of the Batangas State University ARASOF Nasugbu. The researchers made a detailed and focused study on designing and adaptability the fingerprint engine starter to provide more security for motorbikes and scooters. They estimated up the complete study and concluded that there was a significant difference between the existing Electric Engine Starter System and the Fingerprint Engine Starter for Motorbikes and Scooters. The modified Fingerprint Engine Starter for Motorbikes and Scooters offered more security than the existing Electric Engine Starting System.

It focuses on the Fingerprint Engine Starter for motorbikes in a better sleek and more shielded vehicle’s engine starting for motorbikes and scooters that have electric engine starters. This limits the number of users that makes the motorbikes and scooters more secure because the registration process of fingerprint of a new user is in such a way that it needs a tolerable setup. The device that makes a motorbike or scooter secure needs to recognize the user before it starts its engine. This process of recognition was done by authenticating the user’s fingerprint. They aimed the study to improve the security of the motorcycles and scooters which are commonly used in today’s world. They also aimed it to create a newer and better starting system for motorbikes and scooters. Specifically, this study could change the current electric engine starter system, and the developed fingerprint engine starter system showed its best performance in terms of accuracy, efficiency, security, reliability, user-friendliness, and determining the significant difference of the level of acceptability of the two systems in terms of mentioned criteria.

We did a thorough study on paper [4] [Fingerprint based vehicle starter]. In this paper, they focused on the use of a fingerprint recognition system for starting the process of igniting the ignition of the motorcycle by replacing the use of traditional methods of key locks. Related work included enhancing the security of the bikes by adding different locks and alarming units to alert the owner of the bike in case of danger.

Fingerprint recognition technology allowed access to the registered users those whose fingerprints were pre-stored in the database. They later compared stored fingerprints with the fingerprint sample collected at the initial stage of authentication. These eliminated the need of keeping track of keys and the problem that occurs
when the keys were not found at the time of emergency. By implementing this system the user can start his motorbike during his presence since there are no keys or combinations to be copied or stolen or locks that can be cracked. The fingerprint-based lock, therefore, provided an effective solution to conventionally encounter inconveniences.

### III. COMPARATIVE ANALYSIS

**Paper Name:**
Vehicle starting system using fingerprint

**Author:**
Dr. V. Nandagopal, Dr. V. Maheshwari.

**Proposed System:**
This system requests for user's fingerprint, processes it and gives output if the finger they stored in the fingerprint modules database has a match of it. The system could also enroll new user's finger at request but prompt for passcode before they could register it.

**Limitation:**
This system requests for user's fingerprint, processes it and gives output if the finger they stored in the fingerprint modules database has a match of it. The system could also enroll new user's finger at request but prompt for passcode before they could register it.

**Paper Name:**
Development of vehicle ignition using fingerprint.

**Author:**
Jamil Abedalrahim Jamil Alsayaydeh, Win Adiyansyah Indra, Adam Wong Yoon Khang, Vadym Shkarupylo and Dhanigaletchmi A. P. P. Jkatisan

**Proposed System:**
The project's aim was to develop a vehicle ignition using fingerprint, and that was successfully developed. Successful steps were taken to notify the allowed user via SMS using GSM in their project. SMS's were sent to the owner when the vehicle was turned on and when an unauthorized user was detected a theft alarm from the buzzer, a notification to the owner's mobile phone via GSM SIM 900 and status display on the LCD was shown also the vehicle motor was not started.

**Limitation:**
This project was also practiced on cars/ wagon. Quite difficult to use this circuit on motorbikes and scooters because of the physical characteristics of the circuit developed.

**Paper Name:**
Development of fingerprint engine starter.

**Author:**
Froilan G. Destreza1, Antonio P. Nepomuceno III2, Christopher C. Drio Jr.

**Result:**
The primary purpose of their study was to know about the development of electric engine starter into a fingerprint-based engine starter to enhance and create a top security on motorbikes and scooters which were commonly used by students. The system they studied gave a positive result to secure motorbike by limiting the number of users because of the registration process of fingerprint of a new user, which is in such a way that it needs a tolerable setup.
Limitation:
No other method of starting the vehicle was used, due to which it was difficult for the user to start the vehicle if the device got any defect.

Paper Name:
Fingerprint based vehicle starter.

Author:
Prof. Kharade R. A, Snehal Shirtode, Priyanka Sutar.

Proposed system:
Fingerprint recognition technology allowed access to the registered users whose fingerprints were pre-stored in the database. They later compared stored fingerprints with the fingerprint sample collected at the initial stage of authentication. These eliminated the need of keeping track of keys and the problem that occurs when the keys were not found at the time of emergency.

Limitation:
Basic implementation of the system was done, which did not included any precaution measures that need to be taken of devices durability. Also no other method of starting the vehicle was used, due to which it was difficult for the user to start the vehicle if the device got any defect.

IV. CONCLUSION

The development of our project will result in providing quick and safe system for users of motorbike. Basically, we will integrate features of previously build systems and also try to overcome the drawbacks of the existing systems. Our system implementation will be used by using the latest hardware software technologies through which it would be easy to use and also user convenient. This project will help to reduce the cases of motorbike theft as difficult for a thief to spark the vehicle's ignition system because of disabling use of master key and cloned keys. Also, it will reduce crimes and help to decrease the rate of motorbike theft happening now days. Moreover, this system will be proved to be simple to use and reliable in performance. Providing safety to user’s motorbike is the primary goal of our project. Conclusion is that while developing this project, we understood many aspects of project development that were unknown to us.

ACKNOWLEDGEMENTS

We have taken huge efforts to develop this survey paper up to the current stage. However, it would not have been possible without the kind support and help of many individuals and organizations. We would like to extend my sincere thanks to all of them.

We take great pleasure in presenting this report on “Biometric based motorbike ignition starter using arduino”. We would like to show my heartfelt indebtedness to my guide Prof. T.R. Shinde, whose valuable guidance has helped us to make survey of our project. And we kindly thank to Ms. S.L. Mortale, HOD of Information Technology for providing the necessary resources.

V. REFERENCES


[16] https://github.com/sparkfun/Fingerprint_Scanner-TTL/