BLUETOOTH ENABLED FINGERPRINT LOCKING SYSTEM

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ABSTRACT

The integration of a Fingerprint Door Lock System with Mobile Phone via Bluetooth marks a notable progression in access control technology. This cutting-edge system seamlessly merges the reliability of biometric authentication, specifically fingerprint recognition, with the ease of mobile phone connectivity through Bluetooth. Users can effortlessly enrol their fingerprints using a dedicated mobile application, which establishes a secure Bluetooth link with the door lock system. As individuals approach the door, they are prompted to verify their identity by scanning their pre-registered fingerprint through a biometric sensor. To sum up, the Fingerprint Door Lock System using Mobile Phone via Bluetooth represents a significant leap in access control technology, blending security, convenience, and scalability. Its focus on biometric security, mobile-friendly interactions, and remote access control positions it as a versatile solution for both residential and commercial purposes, promising to redefine how we secure and manage access to our living and working spaces.

Keywords : Arduino Uno, Keyless Entry System, Smart Lock, Android application, BLE.

1. INTRODUCTION

The scope of this paper is to propose Fingerprint door lock system The Fingerprint Door Locker concept directly addresses security concerns in our daily lives. Traditional physical keys are susceptible to cheap duplication, loss, or theft. To mitigate these issues, incorporating biometric security gadgets enhances security significantly. Biometrics offer advantages as they cannot be stolen, lost, and have low chances of duplication, providing robust protection against security breaches. Throughout history, security has been a major concern for companies, households, and individuals. Combining a door lock with biometrics emerges as a viable solution. Biometric verification uniquely identifies individuals through distinguishing biological traits, including fingerprints, hand geometry, earlobe geometry, retina and iris patterns, voice waves, DNA, and signatures. The system involves a fingerprint sensor capturing the user's fingerprint, which is then forwarded to the microcontroller for comparison with stored records. If a match is found, the microcontroller either locks or unlocks the latch based on its current state. In the absence of a match, no action occurs, and the user must retry. The system resets upon entering a known fingerprint. Fingerprint usage for biometric verification is chosen due to its uniqueness, making it a reliable key for door locks. This approach significantly reduces the risk of unauthorized access, as duplicating such a unique key is practically impossible. Moreover, this system eliminates issues like key loss, as there is no need to carry physical keys when using this system instead of traditional locks. The implementation of this system using Arduino aims to enhance security features and elevate the overall security level. Employing biometric verification, particularly fingerprint recognition, not only fortifies security against trespassing but also eliminates the inconvenience of key-related problems. The integration of Arduino technology adds a layer of sophistication to ensure a seamless and advanced security experience.

2.TERMINLOGIES

BLUETOOTH-ENABLED FINGERPRINT LOCKING SYSTEMS

1. Bluetooth Connectivity in Locking Systems: Emphasizing the integration of Bluetooth technology to facilitate seamless communication between the locking system and user devices, encompassing Bluetooth low energy, reliability, and addressing potential susceptibilities to unauthorized access or cyber threats.

2. Biometric Authentication through Fingerprint Scanning: Explores the incorporation of fingerprint interface technology as a robust method for authentication and access control within the locking system.

3. Advanced Access Control with Intelligent Door Lock Systems: Encompasses a broad spectrum of locking systems that leverage smart and connected features, showcasing interfaces like Bluetooth and fingerprint recognition to enhance security and convenience**.**

4. Safeguarding Locking Systems: Examines the multifaceted landscape of security measures and potential vulnerabilities within these systems, delving into aspects such as encryption techniques, susceptibility to man-in-the-middle attacks, and the application of AES encryption for securing Bluetooth communications.

5. Fortifying Cybersecurity in Smart Lock Systems: Sheds light on the paramount importance of cybersecurity in the realm of smart locks, emphasizing considerations like Bluetooth security, the robustness of mobile application security, and the looming risks associated with unauthorized access and cyber intrusions.

3. LITERATURE REWIEW

3.1 Password Enabled door locking system using Arduino and IOT

In this day and age, security has become of an utmost importance, be it one's house, car or their digital accounts. The solutions currently available in the market are satisfactory but high security solutions come at an expensive price. Hence, an economically feasible security system has become the need of the hour. The password enabled door locking system can be used for households, offices, desk units, etc. The system will check for the validity of the password entered by the user and will unlock only for the authorized users. This system proves to be an optimal solution for preventing the unauthorized entries.

3.2 Construction of Smart door Security System using Arduino and Bluetooth application

Recently home security system has been very poor. These research projects consist of a smart door locking system which provides a great solution to improve the home safety management of doors. Arduino IDE software and a Bluetooth module hc-05 were used to connect between the smartphone, the microcontroller and the door lock to give an easy access to authorized persons. The person with the authority to open the door can have access within their fingertips by installing the required application which has open/close button. The hc-05 serves as a receiver and transmitter but also communicates with the microcontroller which serves as a processing unit in this project and decides whether the password entered by the user is right or wrong and then send the servo motor to either open or close the door. If the password is right the user can have access to the door and when the password is wrong the user will have no access whatsoever. Enhancing the safety and security of main entrance doors.

3.3 Password-based door lock System

The need of safety can be achieved by making locks which can be electrical or mechanical with one or a few keys, but for locking a big area many locks are required. As everyone knows old fashioned locks are heavy weight and fragile also depending on the tools,Therefore electronic locks are given more value than those of mechanical locks. Nowadays every device's operation is based on digital technology. For example, technology based identity devices are used for automatic door unlocking or locking. These locking systems are used to control the movement of door and are functional without requiring a key to lock or unlock the door These locking systems are controlled by a keypad and are installed at the side hedge of the door. When the correct passcode will be entered, the microcontroller will give instruction to servo motor. Servo motor will perform the action on door unlocking. Thus, what we want is digital technology to construct an integrated and well customized safety system at a price which is reasonable

3.4 Wireless Biometric Lock using Arduino with the IoT

Nowadays office/professional workplace security is a significant danger looked by each person when away from home or at the home. With regards to security frameworks, it is one of the essential worries in this bustling serious world, where human can't discover approaches to give security to his private

things physically. Rather, He finds an elective arrangement which gives better, solid and atomized security. This is a time where everything is associated through organization, where anybody can get hold of data from any place around the globe. Along these lines odds of one's data being hacked are a difficult issue. Because of these dangers it's essential to have some sort of close to home recognizable proof to get to one's own information. Presently a day's very own ID is turning into a significant issue in general. Among standard individual distinguishing proof strategies, we generally observe secret phrase and ID cards methods. In any case, it is anything but difficult to hack secret word now and recognizable proof cards may get lost, subsequently making these techniques very untrustworthy.

3.5 Smart Door Lock System

As technology continues to advance, the security of corporate environments and offices has become a top priority. With the increasing risk of data breaches and unauthorized access, it is crucial to have an automated and dependable security system in place. Traditional methods of identification, such as passwords and ID cards, are no longer foolproof and can easily be compromised. Manual door locks with keys can lead to frustration and inconvenience when keys are lost or misplaced, and smart cards can also be misplaced or stolen. While some may hire caretakers to manage locks and keys, this approach is not always reliable. Smart door lock systems have emerged as an innovative and popular solution to these security concerns. These systems utilize biometric identification for secure access control, allowing only authorized personnel to enter. Furthermore, smart door lock systems eliminate the need for physical keys, making managing access to multiple areas easier. Overall, smart door lock systems provide a dependable and convenient method for securing corporate environments and offices, offering peace of mind to users

4. CONCLUSION

In today's technologically advanced world, autonomous systems are gaining rapid popularity so the advancement in latest technology is continuously and rapidly made on different latest automatic door lock security systems. The need for an advanced door lock security systems using new technologies is increases day by day as security become a very important or serious issue for everybody. Due to the recent trends in various methods of security for home, buildings, companies" vehicles etc, there is no need to worry about this security any longer, as automatic security systems are here to deal with it. This paper tries to focus all

recent door lock security systems in a comprehensive way.

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5. REFERENCES

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