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A DETAILED REVIEW ON FINGERPRINT DOOR LOCK SYSTEM

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Abstract: Passwords and Tokens are extremely vulnerable and are easily stolen or lost. A poor password is one of the most common causes of security and data breaches. Hacker attacks target even the strongest passwords. Resetting the password takes a long time and can cause the employee to lose productivity. Biometrics can be used to solve the problem. It is the method of recognizing or confirming individuals based on physiological or behavioral features such as the iris, fingerprints, facial pattern, DNA, speech patterns, and so on. The concept of distinguishing individuals based on their fingerprints goes back thousands of years. It first became famous in the 1970's. The detection and authentication of fingerprints is the method of fingerprint identification. Fingerprint identification is the most commonly used biometric. This research paper explains the main characteristics of fingerprints and how the Automatic Minutiae Detection process works, as well as comparing 2D and 3D fingerprint recognition

Keywords: Biometrics, Security & Minutiae Detection

I. INTRODUCTION

Biometrics alludes to the programmed distinguishing proof of a living individual dependent on physiological or social qualities for verification reason. Among the current biometric advances are the face acknowledgment, finger impression acknowledgment, finger-calculation, hand math, iris acknowledgment, vein acknowledgment, voice acknowledgment and mark acknowledgment, Biometric strategy requires the actual presence of the individual to be recognized. This stresses its inclination over the customary strategy for recognizing what you have, for example, the utilization of secret word, a smartcard and so on Additionally, it possibly forestalls unapproved induction to get to control frameworks or deceitful utilization of ATMs, Time Attendance Systems, PDAs, shrewd cards, work area PCs, Workstations, vehicles and computer networks. Biometric acknowledgment frameworks offer more prominent security and comfort than customary techniques for individual acknowledgment. Unique finger impression acknowledgment addresses the most seasoned technique for biometric distinguishing proof which is traced all the way back to 2200 BC. The utilization of fingerprints as an individual code has a long custom and was at that point utilized.

II. LITERATURE REVIEW

[1] Using radio-frequency identification (RFID) and fingerprint recognition, we are going to present a dual lock. This locking system is so secure and reliable that it can be implemented in home, offices, school and in also in kind of organizations. In case the user lost their RFID card, using their fingerprints they are able to unlock the latches. Fingerprints and the RFID tags are accessible only to the registered user. If an unauthorized person tries to access it, a text message will be sent to the owner as short message service (SMS) using global system for mobile communications (GSM). It also captures the picture of the person using the TTL camera and will be stored in the SD card. The main component of the system is the Arduino Mega 2560 which is interfaced with a fingerprint scanner module, RFID card reader module, TTL camera, SD card module, GSM shield, and liquid crystal display (LCD) and an electric door strike.

[2] An enhanced method of executing and designing of a fingerprint door lock using GSM technology, alarm system, monitoring camera and password system. This Security system provides various security features like limiting unauthorized people access and keeps a record who ever passes through it. In case if any burglars try to break the door, an alarm system is set to alert the nearby people at that surrounding. A GSM module is used to send SMS to the owner and a web cam is used to take video of who tries to break the lock. A fingerprint scanner R305 is interfaced with Arduino microcontroller-ATMEGA328P to control the locking and unlocking process of a door. The LCD panel displays some basic commands to instruct the users. If any unregistered user places his finger in the sensor, then automatically their access will be denied. In places like home,

offices, banks, hospitals, and in other governmental and private sectors, the above proposed door lock security system can be used. When compared to other projects like RFI and password, this security system has shown competitive results when tested.

[3] In recent years, Fingerprint based authentication systems have developed rapidly. At present fingerprint based biometric system are exposed to severe attacks. When compared to different fingerprint sensors and spoofing materials, the single feature based static approach does not perform equally.We propose a static software approach to combine low level gradient features from Speeded-Up Robust Features (SURF), texture features from Gabor wavelet using dynamic score level integration and, pyramid extension of the Histograms of Oriented Gradient (PHOG) in this paper. To overcome the issues faced in dynamic software approaches which require user cooperation and longer computational time, we extract these features from a single fingerprint. By the experimental analysis done on LivDet 2011 data had resulted an average Equal Error Rate (EER) of 3.95% over four databases, while the existing best average ERR was 9.62%. Experiments were performed with Livdet 2013 and achieved an average classification error of 2.27%.

[4] Due to easy access Fingerprints are considered as a unique identification of a person and one of the best and the fastest method used in biometric identification systems. They are so secure and reliable to use as they are so unique and doesn't change for one in a lifetime. Fingerprint recognition using minutiae matching technique is cheap, reliable and accurate up to adequate limits. Fingerprint matching based on minutiae matching is used in this thesis work. Our algorithm also takes into account region and line structures that exist between minutiae pairs unlike other conventional minutiae matching algorithm. For resulting in stronger certainty of matching minutiae, more structural information of the fingerprint is to be accounted. Since most of the region analysis is pre-processed, it doesn't result in making the algorithm slower.

[5] Passwords and Tokens are highly vulnerable and are at high risk of being stolen or lost. One of the main reasons for security and data breaches is a weak password. Even strong passwords are being attacked by hacker attacks. Resetting the password requires a lot of time and may delay the productivity of the employee. It can be resolved by using biometrics. It is a practice of identifying or verifying the individuals based on their unique physiological or behavior ral characters like the iris, fingerprints, facial pattern, DNA, Voice patterns, etc. The idea of identifying people on the basis of fingerprints can be traced back to thousands of years. It first came into practice in around 1970. The Fingerprint identification process is of identifying and verifying the fingerprints. Fingerprints identification is more popular than any other biometrics. This research paper elaborates the key features of fingerprints and the working of Automatic Minutiae Detection process and also compares the 2D fingerprint identification with 3D fingerprint identification.

[6] In the security field, Fingerprint identification which is unique and reliable is being used. Based on fingerprint door lock, we have introduced the design of remote monitoring intelligent system. This system identifies accurately lively fingerprint, when an illegal burglary is happened and sent the unlock ID information to the owner or the monitoring center of management office by the GSM network or by PSTN.

[7] Traditional door locking methods, such as smart and manual, are visible from the outside, and there is a risk of burglary. The proposed solution includes a special internal locking mechanism that is hidden within the main door and is enabled after two stages of security verification are completed. One of the security stages of the mains key of finger print sensor to operate internal locking mechanism is held inside a primary (preliminary) door and is hidden from view until the primary door is opened. When the primary door is successfully checked, it can be opened with either one of the RFID-based primary keys or Bluetooth-based master keys.

[8] Traditional lock systems, passwords, and other security measures were previously used in high-security areas or bank locker rooms. These devices, however, were discovered to be insecure. RFID cards were introduced as a result of technological advances. These cards, on the other hand, were of little use to the consumer due to the risk of being misplaced, stolen, or forgotten. The aim of this research is to develop high-security solutions for such high-end security applications. The aim of this research is to create a smart door access system that incorporates a finger print module. This system is used to limit access to only those who are approved. It is built using both hardware and software technologies.

[9] To enter through our finger print, a finger print recognition device is a security issue. A finger print scanner, such as Microsoft Fingerprint Reader, is used to identify the finger print. The most effective and accurate biometric identification method available is finger print recognition. Every individual is identified by their unique finger prints, which are used to open the lock. It's being researched the most as a biometric technology. The problems of fingerprint identification are known as fingerprint verification and identification. In areas such as security lock door systems, house entries, mobile screen locks, and so on, the finger print pattern matching is commonly used.

[10] The creation and implementation of a Biometric Based Door Lock System is described in this paper, which will automatically unlock a door when a registered fingerprint is detected. To achieve this, a fingerprint scannerR305 is used in conjunction with an ATMEGA 328 Arduino microcontroller to monitor the locking and unlocking process of a door. Access is given to the user after a recorded finger print is put on the sensor, the door slides open, and it closes after five seconds. The 16x2 Liquid Crystal Display (LCD) shows the individual's name along with the registered fingerprint during this process. Access is refused if an unregistered fingerprint is detected.

[11] In our everyday lives, home and building security are major concerns, and wireless smart door locks (DSDL) have become an integral part of these systems. The aim of this paper is to develop and implement a safe DSDL that can grant access to a home using a fingerprint. For the lock/unlock door based on finger print, an Arduino Nano microcontroller module, finger print sensor, and servo motor were used. The DSDL is a user authentication and validation system that automatically authenticates and validates users for safe access. In comparison to existing systems on the domestic market, the implemented framework aims to build a cost-effective DSDL based on low-cost components. The DSDL is a good rival to the di because of its ease of use and cost effectiveness.

[12] In admittance control systems,identifications are the most basic operations. They are seperated into contact and contactless procedures, as well as identifying instruments such as PIN codes, magnet storage media, fingerprints, and speech. Contactless smart cards are used in the admittance control system because the contactless memory medium has many advantages. Apart from keeping track of working hours, the computerized admittance management system often grants complete control over access to specific areas (rooms).It allows for the collection of data on arrival and departure times, as well as a view of people's movement between different areas and controlled access to all of the system's areas. control over access to specific areas (rooms). It allows for the collection of data on arrival and departure times, as well as a view of people's movement between different areas and controlled access to all of the system's areas. The computerized admittance control system is globally composed of monitoring computer, interface between RS232 and CAN bus, CAN bus and microcontroller interface, which manages a contactless card reader, controls electric key-lock and other light and acoustic signals.

[13] The usage of conventional door locks became less practical currently as they can be duplicated easily. A company or an agency should be made a restricted area in order to maintain office security. It is because only the authorized people can access the respective rooms such as server room. In order to overcome these problems, a fingerprint door lock is designed as a replacement for the regular safety conventional door locks. Fingerprint errors can also be detected by this device as well as shooting with a camera simultaneously so that the device helps to enhance the office security to its maximum level. The data obtained with an error percentage below 5% in testing the door lock tool and the data obtained error percentage 100% for the fingerprints which are not registered.

[14] This door locking system project suggest the way of unlocking a door using fingerprint. Most of the door lock systems have many loopholes which could be easily broke down and it creates a concern for a proper working environment and secure lifestyle. One of the most reliable biometric features having a wide range of applications is fingerprint. It provides tools to enforce reliable system transaction logs as well as protect an individual's privacy. In order to provide access to the facility which is used by multiple users, fingerprints of the authorized users are enrolled and verified. A new user can be enrolled as well and an old user can also be removed in the system.

[15] Nowadays security has been a major issue in many applications like banks, home security, institutions, supermarkets etc., so that many research are focused to provide security for application. We can use biometrics to provide a high level security which includes fingerprint scanner, voice recognition, face recognition, hand gesture etc., Among these we are using fingerprint scanner to lock and unlock the door because each person has their unique fingerprints. Two modes are enrolled in this technology named master mode and user mode. The master mode has main key to register new fingerprint in which the user mode compares the stored template to provide access to new users. Biometrics and embedded systems are the two technologies we use to provide security in which the authorized users biometrics is sensed through fingerprint sensor.

III. CONCLUSION

The fingerprint module scans the fingerprint and send the microcontroller and verifies the scanned fingerprint with stored fingerprint. When the fingerprint gets matched the solenoid lock gets unlocked. The performed research allows to draw a conclusion about the finger print door lock and thus following conclusions are concluded by studying the review papers

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