

Advanced Multi-level Security System using Raspberry pi-3

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Abstract: Today people are facing more problems about security in all over world, nowadays security is the most essential issue everywhere in the world; so security of everything gains higher and higher importance in recent years. Here in this paper, trying to reproduce the comprehensive literature study related to the various door locks and gate security systems that are necessary in the fields such as home, industries and vehicle security where possibilities of incursion are increasing day by day. In past days, the research is gone on various door lock security systems like traditional security systems which provide indications using alarm. Due to the advancement in recent techniques, some door lock security systems are based on microcontroller, GSM, GPS, many sensors, software like MATLAB, PROTEUS, biometrics like face recognition, Iris scanner, RFID, Smart Card and password etc. Each system has their own advantages and disadvantages. In most of systems, SMS technique is used for communication so the system will become cost effective, more reliable and it will take less time to deliver message. As security becomes major problem nowadays, the security monitoring systems today needs to make use of the latest technology. In some papers, the authors have presented door lock security monitoring system based on embedded and Zigbee and sometimes the lock is protected by automatic password hence it could not easily hack by hackers. Also the enhanced security systems are available based on android platform, wireless techniques and embedded systems. A lot of modification takes places in various Door lock security from the last few years, in next coming years many changes will takes place.

Keywords: Door Lock Security, GSM, RFID, SMS, Sensors, Camera, Alarm.

INTRODUCTION

Security represents protection of our life and assets. Ensuring safety of peoples and their valuable things is very important for the prevention of illegal handling. Hence, mainly focusing on door lock security or gate security is very important to avoid the further problems in monitored area [2]. Even with the use of mechanical locks, the crime, robberies get happened due to the fact that such locks were easily broken. So, there is a need to invent other kind of locks which cannot be easily broken. So, many authors present different kinds of digital door locks, automatic password based door locks, software based door locks etc. which have been widely used in houses and offices.

The prevention of unauthorized entry into buildings through the main doors is done by using ordinary, electronically operated locks, digital codes and biometrics technique like the finger print technology or some are based on thumb printing only. Nowadays, advanced automatic door security systems are available with the use of palmtop recognition systems face recognition systems, face detection systems, wireless sensors, PIR sensors, RFID techniques, smart cameras and many more that helps people to make their home or organizations secure from long distance. Hence, people need not to be worry about the home security though they are away from home.

Doors are to keep people out. They are being made of metals not simply wood any longer. The security sectors are experiencing various as it has never seen before. So, demand is to audit the authenticity of currently available systems and need is to research for the creation of more reliable and good systems which operate smartly with no more efforts. The important thing is to provide higher security.

LITERATURE REVIEW

[1] Now a day's so many useful technologies are coming out to make our life style more comfort, luxurious and secure, with these latest advanced technologies we are providing sophisticated security systems. The main aim of this project is to provide high security to the ATMs with the help of advance technologies like android Application, GSM and Bluetooth technology. To communicate with modules we need a powerful and fast processing micro controller, for this purpose we are using ARM7 based LPC2148 32 bit micro controller. In this system, Bluetooth technology is used in level1 security layer, it asks mobile password which should be entered from android mobile, send virtual password via Bluetooth communication to micro controller, then it checks second level using GSM technology, then controller sends one time password to preregister mobile number. If the user has that mobile with him then only he can see that password and allowed to next level of security by entering it using keypad and status will be displayed in LCD.

System

[2] This paper addresses a very common problem encountered in day to day life which often remains an abstract thought. Often in colleges, students run a risk of misplacement or theft of their valuables. A security system was designed and developed for safety

of the belongings of the students in the college. It includes the basic information, schematic, circuit diagram, technical details of the systems used like RFID (Radio Frequency Identification) and Barcode system and design/test data of the developed security system. The assumptions made for the system to function and the specific requirements to be met are included in this paper.

[3] The task of face recognition has been actively researched in recent years. This paper provides an up-to-date review of major human face recognition research. We first present an overview of face recognition and its applications. Then, a literature review of the most recent face recognition techniques is presented. Description and limitations of face databases which are used to test the performance of these face recognition algorithms are given. A brief summary of the face recognition vendor test (FRVT) 2002, a large scale evaluation of automatic face recognition technology, and its conclusions are also given. Finally, we give a summary of the research results.

[4] Face recognition is a technique in which images and patterns are analyzed and recognized. Face detection is known as the identification of face from a video or a image. Many improved techniques are implemented in face recognition in past ten years. Some well-known methods in each category are overviewed and then benefits and drawbacks are mentioned and analyzed in this paper. For the purpose of recognizing the face, the most recent algorithms and the approaching technology methods are analyzed in this paper. Keywords: Face detection, recognition, analyses, biometric, pattern recognition.

[5] In this modern world security has become a major concern in securing a particular area such as banks, institution, temple premises etc. The existing system can be easily broken either by hacking the password or by duplicating entry cards. There are some security system which are very difficult to break but they are neither cost efficient nor easily affordable. We proposed a strong secure and affordable system using RFID, PIN lock and face recognition using raspberry pi3.

[6] Graveness of guarding is an essential component of any system or organization in an increasingly hacking environment. Layers of protection are necessary. This paper presents a model to develop a multilevel security system. To reach or access inner most circle, three stages of security system endorsement will be necessary, making it the primary level of security. These include the Hex Keypad, Bluetooth, and RFID. The valuables in the inner vault are further secured with a secondary system completely separate from the primary, consisting of a fingerprint scanner. Any security breach detected will alert the authorities with the help of a GSM Shield, therefore taking the necessary response immediately. Continuous surveillance with online streaming is also demonstrated using Raspberry Pi and a digital camera, further safeguarding the valuables.

[7] Nowadays the number of thefts and identity fraud has become a serious issue. In order to avoid these thefts and identity fraud, a face recognition system must be established. The scope of this project is to develop a security access control application based on face recognition. The haar-like features is used for face detection and HOG +SVM algorithm is used for face recognition. In order to achieve a higher accuracy and effectiveness we use Open CV libraries and python computer language. Training and identification is done in embedded device known as Raspberry Pi.

[8] There is a growing interest in the smart home system using Internet of Things. One of the important aspect in the smart home system is the security capability which can simply lock and unlock the door or the gate. In this paper, we proposed a face recognition security system using Raspberry Pi which can be connected to the smart home system. Eigen face was used the feature extraction, while Principal Component Analysis (PCA) was used as the classifier. The output of face recognition algorithm is then connected to the relay circuit, in which it will lock or unlock the magnetic lock placed at the door. Results showed the effectiveness of our proposed system, in which we obtain around 90% face recognition accuracy. We also proposed a hierarchical image processing approach to reduce the training or testing time while improving the recognition accuracy. © 2017, Institute of Advanced Engineering and Science. All rights reserved.

tem using the arduino platform. These security systems enable to lock/unlock the door using three different modes i.e. Keypad, Bluetooth and Global System for Mobile (GSM) modules. These three modules operate on a 4-digit password. We can open or close the door by using keypad, bluetooth application from smart phone and also by using 4 digit message from GSM phone. If any unknown person does the three consecutive unsuccessful attempts to enter the password in any one of the system, then arduino controller will send a warning message to preset owner GSM mobile number and also initiate the buzzer alarm as a warning of unauthorized intrusion. We have got the good experimental results and promising analysis in all these three modules.

Abstract. This paper discusses the design and implementations of an electronic door lock/unlock compact system using the arduino platform. These security systems enable to lock/unlock the door using three different modes i.e. Keypad, Bluetooth and Global System for Mobile (GSM) modules. These three modules operate on a 4-digit password. We can open or close the door by using keypad, bluetooth application from smart phone and also by using 4 digit message from GSM phone. If any unknown person does the three consecutive unsuccessful attempts to enter the password in any one of the system, then arduino controller will send a warning message to preset owner GSM mobile number and also initiate the buzzer alarm as a warning of unauthorized intrusion. We have got the good experimental results and promising analysis in all these three mod

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[9] With the world moving towards advanced technologies, security forms a crucial part in daily life. Among the many techniques used for this purpose, Face Recognition stands as effective means of authentication and security. This paper deals with the user of principal component and security. PCA is a statistical approach used to simplify a data set. The minimum Euclidean distance found from the PCA technique is used to recognize the face. Raspberry Pi a low cost ARM based computer on a small circuit board, controls the servo motor and other sensors. The servo-motor is in turn attached to the doors of home and opens up when the face is recognized. The proposed work has been done using a self-made training database of students from B.K. Birla Institute of Engineering and Technology, Pilani, Rajasthan, India

[10] Paper deals with the idea of secure locking automation utilizing IOT for door unlocking system to provide essential security to our homes, bank lockers and related control operations and security caution through the GSM module. It uses an image capturing technique in an embedded system based on raspberry pi server system. RPi (Raspberry pi) controls the video camera for catching it for turning on a relay for door unlocking. The module contains a secured face recognizer for automatic door unlocking. The camera catches the facial picture and compares it with the image which is stored in the database. If the picture is found in the database then the door lock opens otherwise it will produce a SMS that an unknown person is trying to gain access.

[11] Paper describes to design and build a manually controlled surveillance system. The main purpose of this system is to be able to roam around in a given environment self-contained with wireless transmission of data. We are making is to provide visual while transmitting back real time data (video) to the ground station. This real time data can be used by the controller (human) to move the robot around. The robot must be compact and information on of hard to access places, for example a building under a hostage situation. The camera is attached to a stepper motor which makes it feasible to capture the scene or object of interest. The captured video can be enhanced and made intelligible using further image processing on the remote PC thereby eliminating the need for extra hardware on the system. This system can response rapidly as intruder detect, and GSM module will alert home owner on making calls and messages on entering into the home. This security system for alerting a home owner wherever he will be with a phone call and captures the image of that intruder who enters into the home.

[12] In recent years, RFID technology has replaced the bar code system or a magnetic strip on the back of credit cards. This paper proposes a smart library book management system that uses Radio frequency waves to transfer data from a tag attached to the book. The incorporation of RFID technology in a library helps reduce human intervention and has been designed to support the librarian as well as the user. Raspberry Pi and RFID reader(s) are attached to each book rack to detect the correct positioning of the books. A MySQL database has been created, that contains information of the books in the library. A web page is also designed to display the location of the misplaced books that helps the librarian.

[13] In this modern world security has become a major concern in securing a particular area such as banks, institution, temple premises etc. The existing system can be easily broken either by hacking the password or by duplicating entry cards. There are some security system which are very difficult to break but they are neither cost efficient nor easily affordable. We proposed a strong secure and affordable system using RFID, PIN lock and face recognition using raspberry pi 3.

[14] This paper deals with the design and implementation of Smart image monitoring system using Raspberry pi for mobile devices. It increases the usage of mobile technology to provide essential security to our homes and for other control applications. The paper presents the design and implementation of an IoT-based Smart Home system for monitoring the Surveillance based upon the real time tracking of the devices at home using Raspberry Pi board, which can be used in homes and societies. The proposed system works on real time monitoring and voice control, so that the camera and switches can be remotely controlled and monitored with or without an android based app. It uses various sensors to not only monitor the real time device tracking but also maintaining the security of your house. The proposed outcome of the project aims as multiple benefits of saving on Security of the home as well as keep the users updated about their home security with an option of controlling the switching of the devices by using their voice or simple toggle touch on their smartphone, and If someone enters in to the home when the owner is not available then owner can able to view the person from anywhere and also they can instruct them via live voice.

[15] In recent years, there has been a growing interest among consumers in the smart home concept. Home Security System represents and reports the status of the connected devices in an intuitive, user-friendly interface allowing the user to interact and control various devices with the touch of a few buttons. There are various technologies used for Home Security such as Bluetooth,

Wi-MAX and Wireless LAN (Wi-Fi), Zig-Bee, and GSM. Among these GSM is the most widely used technology in the world. In this paper, we are proposing the use of various types of sensors such as PIR motion sensor, Gas Leakage sensor and Fire Sensor to detect the change in surrounding of the home and notify the user by sending an SMS via GSM module SIM900A. The user can have access to turn the sensors ON and OFF by using an application connected via ESP Wi-Fi module

CONCLUSION

This project is fabricated on the basis of literature and research on different journal and paper relevantly available and fabricated in accordance so it can provide flexibility in operation. This innovation is easy and less costly and has lot of room to grow more economical. This project “Advanced multilevel security system using raspberry pi 3” is designed with the hope that it is very much economical and helpful to secure valuables. On the basis of this, design, estimating cost and availability is very cheap and very useful for the society.

On the basis of these results we can conclude that in the current work we developed a system by integrating three systems into a single system with the help of Raspberry pi 3. This project paves way to build a cheap, strong and reliable security system for future research works. It is an innovative method of minimizing manual stress. The project carried out by us made an impressive task in the social purpose and it is very useful for the safety purpose. The objective of the project was successfully achieved.

FUTURE SCOPE

The future scope of security systems is using iris scanning.

For more safety we can modify this project by adding an iris scanner which is very unique in identifications and detections. It is very fast in response while time and money can be saved.

Regardless of the challenges, the popularity of iris scanning—and its cousin, facial recognition technology—is growing. This is particularly true in physical security applications, like those used at some airports and government installations.

To process large numbers of individuals, a biometrics solution must be fast and non-intrusive. Products like Sarnoff's [Iris On the Move \(IOM\)](#) (video) allows the scanning of up to 30 people per minute from a distance of several feet. The scanned individuals do not even have to stop. Compare this with an expected throughput of 10 to 15 people per minute with high-end hand or fingerprint scanners. Contact scanning is the future of biometrics. Iris scanning is positioned to take a central role.

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