

DOWNLOAD PDF FINGERPRINT BASED ATTENDANCE SYSTEM PROJECT

Chapter 1 : Biometric Security System using Arduino and Fingerprint Sensor

The circuit of this fingerprint based attendance system project, as shown in the above diagram is quite simple. It has Arduino for controlling all the process of the project, push button for enrolling, deleting, selecting IDs and for attendance, a buzzer for alerting, LEDs for indication and LCD to instruct user and showing the resultant messages.

Every academic institution poses some standards concerning how attendance is to be confirmed for student in classes, laboratory sessions and examination halls. That is why keeping the accurate record of attendance is very important. The approach of using paper sheets and the old file system to confirmed students has been in use for years. There are so many bottlenecks with the conventional method, one of such problem is the difficulty for the management to compute the percentage of student attendance in classes and frequently modify their information. Also in institution, tracking and monitoring student time of attendance could be tedious task, time consuming and as well prone to errors. As an alternative to traditional manual clocking process by students in classes or during examination, biometrics characteristics can be used for authenticating students. The fingerprint Biometrics is adopted in this research work for the fact it is one of the most successful applications of biometric technology. In the manual signing processes, where lecturer give a sheet of paper to student to write their names and signature as a form of confirming their presence for a particular class session, falsification in student attendance mostly occur a situation where by a student can sign on behalf of his or her colleague as being present in the class when not true can be so difficult to prevent from happening especially for large classes where row count can takes longer time International Journal of Computer Science and Network Security The trending concern in this modern world is regarding national security, identifying theft as well as on-line terrorism. Biometric identification is any automatically measurable, robust and distinctive physical characteristic or personal trait that can be used to identify an individual or verify the claimed identify of an individual. It is the features captures that is being transformed digitally into a template. The recognition software can then be use to discover an individual as the person they claim to be. Fingerprint recognition is the most common biometric method adopted in identification of a person Ismail Biometric is a field of technology that uses automated methods for identifying and verifying a person based on physiological and behavioral traits. Because some parts of the human body is use in biometrics, the issue of getting lost is not possible and for password to be easily guess can be easily avoided. Also, utilizing biometrics in most cases can be said to be more efficient when speed is considered and convenient than employing password and ID cards method. Using a particular person fingerprint as a form of authentication is just like using natural physical data as a password. The benefit of using biometric authentication is that it is absolutely distinct to each person. There are no two different individuals with the same fingerprint, it is difficult and impossible for one another to have the same fingerprint, and fingerprints from different people can never be the same. Also, a fingerprint can never be guess by a criminal, such as a password which imposter can easily predict using a user birth date or any other common password. Infiltration is very hard to come by due to the fact that criminal will not be able to snoop around to steal user password when using ATM with the 4-digit pass code Valasquez Fingerprint can be categorize as one of the most mature biometric traits and is accepted in courts of law as a legitimate proof of evidence. Fingerprints are adopted in forensic analysis globally in investigations of criminal. More recently, there are growing numbers of individuals and commercial users that are currently using or strongly putting into consideration of using fingerprint-based identification for no any other reason other than the matching performance biometric technology has demonstrated as well as a better understanding of fingerprints. Although there are so many positive impacts for using biometric authentication, however, unlike username and password, biometric data is a physical feature of a person that is fixed and cannot be change. If a person could have access to adequate scan another person fingerprint, that scan has the capability to trick the Touch ID system. As fingerprint scanning becomes more widely accepted anywhere anytime, this may become a substantial challenge. A criminal can have access to different accounts because with one

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fingerprint, a criminal may have access to multiple accounts that implemented authentication using fingerprint

1. Falsification in student attendance does occur rampantly in the traditional method. For example, another student can easily sign an attendance on behalf of another student. In order to prevent this problem, it is necessary to develop an Authentication System for Students using fingerprint Biometric recognition that will be employed to track and keep the attendance of every student in a particular class. Fingerprint is a unique feature for everyone compared to using barcodes in smart cards. Therefore, this system designed in this project work is not based on the existing barcode system. Tracking and monitoring student time of attendance could be tedious, time-consuming and more susceptible to errors. The security of the existing attendance system that is now used in classroom signature systems can be easily compromised. Thereby, helping their colleagues who are absent for a particular class to sign the attendance sheet using the duplicated signature. The Fingerprint Attendance monitoring system designed in this research work for students is a more secure platform where students mark their attendance with their fingerprint. This is to be achieved by the following objectives: The system will be a window-based application developed using Microsoft Visual Basic. It does not cover other aspects of biometric. Therefore, there is every possibility that enrolled users can be rejected by the system. Also, the scanner or sensor cannot distinguish between a real and an artificial finger, therefore it is possible to fool the scanner. In addition, if an enrolled fingerprint is duplicated or spoofed, it is not possible to change a fingerprint as in the case of a password because of user fingerprint biometric. Finally, since the system will be designed using Visual Basic. One of the risks of using a paper in class attendance is that it can be easily misplaced and students cheat by signing for each other not present in the class, thereby defeating the aim of taking the attendance. Tracking and monitoring students' time of attendance could be tedious, time-consuming and susceptible to error. Thus, the system will drastically reduce the time needed to verify attendance data. The system also allows the institution management to track or investigate student class attendance in a particular course having poor attendance, thereby enabling the management to rectify the situation by providing the necessary interventions. The system provides a high level of security, whereby making it impossible for imposters and impersonators in making their way to examination halls. The system using fingerprint biometric will keep historical data, making it easy for lecturers to access and grade students. The system allows the lecturer to monitor each student's attendance, track down truants and take the appropriate action. Thus, the system eliminates all these downsides. The authentication system is not only useful to the institutions and lecturers alone, even the students benefit a great deal by reducing the stress in queuing up, which results in delay and often time in the damage of the attendance sheet. It also prevents mistakes and anomalies that are associated with manual signing, in which students that attend a class are marked as not present, thereby losing the mark accorded to the particular attendance due to multiple attendance sheets.

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Chapter 2 : Fingerprint Based Biometric Attendance System using Arduino -Use Arduino for Projects

In fingerprint attendance system project, the method distinguishes the match between two human beings by their fingerprint. In fingerprint based attendance system project, fingers are the main focus because of their characteristics that vary from person to person.

It will eliminate the problems of manual method. The new system utilizes a portable fingerprint scanner as the input to acquire fingerprint images and notebook personal computer as the mobile terminal for the processing of the images and records attendance. The system was tested and found working correctly. Every academic institution poses some standards concerning how attendance is to be confirmed for student in classes, laboratory sessions and examination halls. That is why keeping the accurate record of attendance is very important. The approach of using paper sheets and the old file system to confirmed students has been in use for years. There are so many bottlenecks with the conventional method, one of such problem is the difficulty for the management to compute the percentage of student attendance in classes and frequently modify their information. Also in institution, tracking and monitoring student time of attendance could be tedious task, time consuming and as well prone to errors. As an alternative to traditional manual clocking process by students in classes or during examination, biometrics characteristics can be used for authenticating students. The fingerprint Biometrics is adopted in this research work for the fact it is one of the most successful applications of biometric technology. In the manual signing processes, where lecturer give a sheet of paper to student to write their names and signature as a form of confirming their presence for a particular class session, falsification in student attendance mostly occur a situation where by a student can sign on behalf of his or her colleague as being present in the class when not true can be so difficult to prevent from happening especially for large classes where row count can takes longer time International Journal of Computer Science and Network Security The trending concern in this modern world is regarding national security, identifying theft as well as on-line terrorism. Biometric identification is any automatically measurable, robust and distinctive physical characteristic or personal trait that can be used to identify an individual or verify the claimed identify of an individual. It is the features captures that is being transformed digitally into a template. The recognition software can then be use to discover an individual as the person they claim to be. Fingerprint recognition is the most common biometric method adopted in identification of a person Ismail Biometric is a field of technology that uses automated methods for identifying and verifying a person based on physiological and behavioral traits. Because some parts of the human body is use in biometrics, the issue of getting lost is not possible and for password to be easily guess can be easily avoided. Also, utilizing biometrics in most cases can be said to be more efficient when speed is considered and convenient than employing password and ID cards method. Using a particular person fingerprint as a form of authentication is just like using natural physical data as a password. The benefit of using biometric authentication is that it is absolutely distinct to each person. There are no two different individuals with the same fingerprint, it is difficult and impossible for one another to have the same fingerprint, and fingerprints from different people can never be the same. Also, a fingerprint can never be guess by a criminal, such as a password which imposter can easily predict using a user birth date or any other common password. Infiltration is very hard to come by due to the fact that criminal will not be able to snoop around to steal user password when using ATM with the 4-digit pass code Valasquez Fingerprint can be categorize as one of the most mature biometric traits and is accepted in courts of law as a legitimate proof of evidence. Fingerprints are adopted in forensic analysis globally in investigations of criminal. More recently, there are growing numbers of individuals and commercial users that are currently using or strongly putting into consideration of using fingerprint-based identification for no any other reason other than the matching performance biometric technology has demonstrated as well as a better understanding of fingerprints. Although there are so many positive impacts for using biometric authentication, however, unlike username and password, biometric data is a physical feature of a person that is fixed and cannot be

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change. If a person could have access to adequate scan another person fingerprint, that scan has the capability to trick the Touch ID system. As fingerprint scanning becomes more widely accepted anywhere anytime, this may become a substantial challenge. A criminal can have access to different accounts because with one fingerprint, a criminal may have access to multiple accounts that implemented authentication using fingerprint. Falsification in student attendance does occur rampantly in the traditional method. For example, another student can easily sign an attendance on behalf of another student. In other to prevent this problem, it is necessary to develop an Authentication System for Students using fingerprint Biometric recognition that will be employed to track and keep the attendance of every student in a particular class. Fingerprint is unique feature for everyone compare to using barcode in smart cards. Therefore, this system designed in this project work is not based on the existing barcode system. Tracking and monitoring student time of attendance could be tedious, time consuming and more susceptible to errors. The security of the existing attendance system that are now use in classroom signature system can be easily compromised. Thereby, helping their colleague who are absent for a particular class to sign the attendance sheet using the duplicated signature. The Fingerprint Attendance monitoring system designed in this research work for student is a more secure platform where students mark their attendance with their fingerprint. This is to be achieved by the following objectives: To carry out the analysis of manual processes involved in class attendance and examination attendance. To design a new system for the i above and To implement the design using Microsoft Visual Basic. The system will be a window based application developed using Microsoft Visual Basic. It does not cover other aspects of biometric. Therefore, there is every possibility that enrolled users can be rejected by the system. Also the scanner or sensor cannot distinguish between a real and an artificial finger, therefore it is possible to fool the scanner. In addition, if an enrolled fingerprint is been duplicated or spoof, it is not possible to change fingerprint as in the case of password because user finger biometric. Finally, since the system will be design using Visual Basic. One of the risks of using a paper in class attendance is that it can be easily misplaced and students cheat by signing for each other not present in the class thereby defeating the aim of taking the attendance. Tracking and monitoring students time of attendance could be tedious, time consuming and susceptible to error. Thus, the System will drastically reduce time needed to verify attendance data. The System also allows the institution management to track or investigate student class attendance in a particular course having poor attendance thereby enabling the management to rectify the situation by providing the necessary interventions. The system provide high level of security whereby making it impossible for imposters and impersonators in making their ways to examination halls. The System using fingerprint Biometric will keep historical data making it easy for lecturers to access and grade students. The system allows the lecturer to monitor each student attendance, track down truants and take the appropriate action. Thus, the system eliminates all these downsides. The Authentication system is not only useful to the institutions and lecturers alone, even the students benefit a great deal by reducing the stress in queuing up which result in delay and often time in the damage of the attendance sheet. It also prevents mistakes and anomaly that is associated with manual signing in which student that attend a class are marked as not present thereby losing the mark accorded to the particular attendance due to multiple attendance sheet.

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Chapter 3 : Bio-metric (Finger Print) Based Attendance system | Free source code, tutorials and articles

Working of Fingerprint Based Attendance System. Working of this fingerprint attendance system project is fairly simple. First of all, the user needs to enroll fingerprints of the user with the help of push buttons.

Besides enroll key is also used to download attendance data over serial monitor. You can check some more projects using fingerprint module: Fingerprint based biometric voting machine Here we have added a Yellow LED which indicates that fingerprint module is ready to take an image of the finger. A buzzer is also used for various indications. Arduino is the main component of this system it is responsible for control of the whole system. Now LCD will ask to place finger over the fingerprint module. Now user needs to place his finger over finger print module and then the module takes finger image. By the same method, all the users will be registered into the system. Now LCD will let you know that fingerprint has been deleted successfully. If fingerprint ID is detected then LCD will show Attendance registered and in the same time buzzer will beep once and LED will turn off until the system is ready to take input again. Time and date are running continuously in the system. Here we have created 5 user space in this system for 30 days. We have byte memory in Arduino UNO out of which we have byte to store data and we have taken 5 user attendance data for 30 days. And every attendance will record time and date so this becomes 7-byte data. By this, we will not able to store 32 byte or 5 attendance records of the 5th user. You may try it by 4 users by changing some lines in code. A buzzer is also connected at pin A5. The fingerprint attendance system code for arduino is given in the subsequent sections. Although the code is explained well with comments, we are discussing here few important parts of the code. First of all, we include the header file and defines input and output pin and define the macro and declared variables. After this, in setup function, we give direction to defined pin and initiate LCD and finger print module After it, we have to write code for downloading attendance data. If amatch occurs then proceed with next step. Given Function is used to taking finger print image and convert them into the template and save as well by selected ID into the finger print module memory.

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Chapter 4 : Fingerprint Attendance System using Arduino - Best Engineering Projects

Fingerprint based attendance management system can be used at many places like Industries, Offices, and Colleges or even at various shops & malls. Main parts of this project are Microcontroller, Fingerprint module, Buzzer, Keypad, and LCD display.

The design of the fingerprint-based attendance management system is made up of the following: Staff bio data to be captured includes: Student bio data includes: These features form a template that is used to determine the identity of the user, formulating the process of authentication. The enrolment process is carried out by an administrator of the attendance management system. The enrolment and registration phase is an administrative phase. The user fingerprint as well as other bio-data is stored for the first time into the database for registration. The courses, practicals, tests, lecturers and exams are also registered at this phase. All data and information required for the proper recording of attendance are enrolled in this module. The most commonly employed method of minutiae extraction is the Crossing Number CN [9] upon which this research is based. It involves the use of the skeleton image where the ridge flow pattern is eight-connected. The minutiae are extracted by scanning the local neighbourhood of each ridge pixel in the image using a 3 x 3 window. The CN value is then computed, which is defined as half the sum of the differences between pairs of adjacent pixels in the eight-connectivity neighbourhood. Authentication Module The task of the authentication module is to validate the identity of the person who intends to access the system. The fingerprint images captured is enhanced and thinned at the image processing stage, and at feature extraction stage, the biometric template is extracted. Staff attendance is captured twice a day for both arrival and departure time. Student attendance is captured only once for each attendance type. Fingerprint matching approaches includes minutiae-based matching, ridge-based matching and the correlation matching approaches. Minutiae-based representation is commonly used, primarily because forensic examiners have successfully relied on minutiae to match fingerprints for more than a century, minutiae-based representation is storage efficient, and expert testimony about suspect identity based on mated minutiae is admissible in courts of law [10]. Therefore matching two minutiae point patterns with each other are considered as a 2D point pattern problem. The point patterns are constructed only on positions x, y of minutiae in the plane. With enough points in each pattern the positions x, y of the minutiae are the only information that is needed for good matching results. Let T and I be the representation of the template and input fingerprint, respectively. Let the minutiae sets of the template be given as: For efficient matching process, the extracted data is stored in the matrix format [12] as follows. Number of minutiae points. Row index of each minutiae point. Column index of each minutiae point. Orientation angle of each minutiae point. During the matching process, each input minutiae point is compared with template minutiae point. In each case, template and input minutiae are selected as reference points for their respective data sets. The reference points are used to convert the remaining data points to polar coordinates. The Equation 4 is used to convert the template minutiae from row and column indices to polar coordinates. Similarly the input matrix data points are converted to polar coordinates using the Equation 5. Rotate values k, m represents the difference between the orientation angles of T_k and I_m . T_k and I_m represent the extracted data in all the columns of row k and row m in the template and input matrices, respectively. The Database The attendance management system database consists of tables that stores records, each of which corresponds to an authorized person that has access to the system. The database design for the system implements relational data model which is a collections of tables in which data are stored. SQLServer is fast and easy, it can store a very large record and requires little configuration. System Performance and Evaluation Given a fingerprint matcher, one would like to assess its accuracy and speed performance in a realistic setting. Unlike passwords and cryptographic keys, biometric templates have high uncertainty. There is considerable variation between biometric samples of the same user taken at different instances of time. Therefore the match is always done probabilistically. This is in contrast to exact match required by password and token based

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approaches. The inexact matching leads to two forms of errors namely: An impostor may sometime be accepted as a genuine user, if the similarity with his template falls within the intra-user variation of the genuine user. The FAR normally states, either in a percentage or a fraction, the probability of someone else matching as you. FAR is defined by the formula: When the acquired biometric signal is of poor quality, even a genuine user may be rejected during authentication. If you fail to match against your own template, then you have been falsely rejected. The probability of this happening is referred to as the false rejection rate, or FRR. Thus, the higher the probability of false rejection, the greater the likelihood you will be rejected. FRR is defined by the formula: The system may also have other less frequent form of error such as: This consists of senior population, laborers who use their hands a lot and injured individuals. Due to the poor ridge structure present in such individuals, such users cannot be enrolled into the database and therefore cannot be subsequently authenticated. The FTE normally states, either in a percentage or a fraction, the possibility of someone failing to enroll in a system. For performance analysis, the application developed was tested using the bio-data and fingerprints collected from One hundred and seventeen users out of which 30 were staff and 87 were students of the department of computer science, the Federal University of Technology, Akure, Nigeria using a live-scan method. The fingerprints were taken from any of the ten fingers of a respective member of the group in which each person must remember the exact finger that was used for the purpose of verification. The reason for this is to allow alternate finger should any of the fingers fails to enrol due to the poor ridge structure present in such fingers. The reason for interest in the use of students and staff of the above mentioned department and school respectively is easy accessibility and their readiness to provide their biometric data for research purposes. During authentication, the biometric of the user is captured again and minutiae data are also extracted forming the test template which is matched against the already stored template in the database. In each case, if the matching score is less than the threshold, the person is rejected otherwise the person is accepted. In the test, the false acceptance rate was zero meaning that there were no cases of false acceptance FAR i. There were a few false rejections FRR during the test in which the system failed to identify some pre-registered users. These could be attributed to improper placement of the finger on the scanner and fingers that have been slightly scarred due to injuries.

Chapter 5 : DESIGN AND IMPLEMENTATION OF STUDENT ATTENDANCE MONITORING SYSTEM US

Project description: This project is to develop a reliable attendance tracking and recording system based on biometric fingerprint identification that can be used to monitor attendance of student.

Chapter 6 : fingerprint based attendance management system - CodeProject

The fingerprint-based attendance management system was implemented with Microsoft's C# on the .NET framework and Microsoft's Structured Query Language (SQL) Server as the backend.

Chapter 7 : FINGERPRINT BASED STUDENT ATTENDANCE MONITORING SYSTEM | UniProjectMateri

The project posted here is a simple Fingerprint Attendance System using Arduino and can be very useful for any place where attendance is taken for maintaining register like office, school etc. Previously, we had posted RFID based attendance system, Arduino Fingerprint Sensor Lock etc.

Chapter 8 : FINGERPRINT BASED ATTENDANCE MONITORING SYSTEM

This is to certify that the project entitled, 'Student Attendance System Based On Fingerprint Recognition and One-to-Many Matching' submitted by Rishabh Mishra and Prashant Trivedi is an authentic work carried out by them

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Chapter 9 : Fingerprint - Based Employee Attendance System | Free source code, tutorials and articles

This project is on the design and development of portable and reliable fingerprint based student attendance monitoring system that can be used to monitor attendance of the student. It will eliminate the problems of manual method.