



An Attendance Monitoring System Using Biometrics Authentication

Seema Rao, Prof.K.J.Satoa

CSE, CSVTU

Chhattisgarh, India

Abstract- *Biometric technology that involves the identification and verification of individuals by analyzing the human fingerprint characteristics has been widely used in various aspect of life for different purposes, most importantly as regards this study the issue of employee attendance. The main aim of this paper is to develop an accurate , fast and very efficient automatic attendance system using fingerprint verification technique. We propose a system in which fingerprint verification is done by using extraction of minutiae technique and the system that automates the whole process of taking attendance, The study was conducted using a quantitative approach by designing a questionnaire as the data collection instrument based on fingerprint matching biometric technologies. The survey involved 6 employees based on stratified random sampling technique. The results however show that fingerprint biometric identifier was found suitable for the employee attendance management system of the organization.*

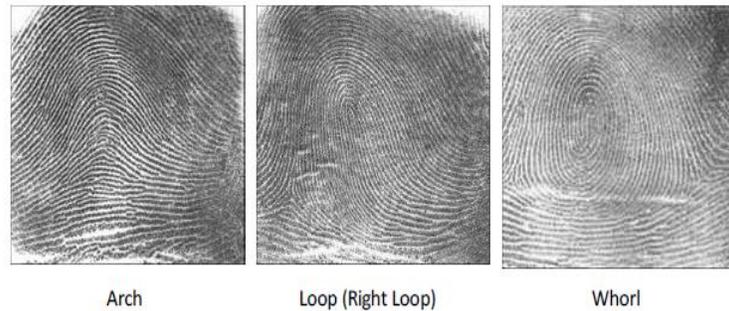
Keywords: *Biometrics , fingerprint ,employee attendance , identifier ,etc .*

1. Introduction

In many institutions and organization the attendance is very important factor for various purposes and its one of the important criteria that is to follow for students and organization employees. The previous approach in which manually taking and maintains the attendance records was very inconvenient task. After having these issues in mind we develop an automatic attendance system which automates the whole process of taking attendance and maintaining it. We already know about some commonly used biometric techniques are used for objective identification ,verification are like iris recognition, voice identification, fingerprint identification, DNA recognition ,etc .Biometrics techniques are widely used in various areas like building security,etc. A fingerprint is an impression of the friction ridges on all parts of the finger. A friction ridge is a raised portion of the epidermis on the palmar (palm) or digits (fingers and toes) or plantar (sole) skin, consisting of one or more connected ridge units of friction ridge skin. These are sometimes known as "epidermal ridges" which caused by the underlying interface between the dermal papillae of the dermis A fingerprint is an impression of the friction ridges on all parts of the finger. A friction ridge is a raised portion of the epidermis on the palmar (palm) or digits (fingers and toes) or plantar (sole) skin, consisting of one or more connected ridge units of friction ridge skin. These are sometimes known as "epidermal ridges" which caused by the underlying interface between the dermal papillae of the dermis The term fingerprint is refers impressions transferred from the pad last joint of fingers and thumbs, though fingerprint cards also typically record portions of lower joint areas of the fingers (which are also used to make identifications)[6]. It is believed that no two people have identical fingerprint in world, so the fingerprint verification and identification is most popular way to verify the authenticity or identity of a person wherever the security is a problematic question. The reason for popularity of fingerprint technique is uniqueness of person arises from his behavior ; personal characteristics are like, for instance uniqueness, which indicates that each and every fingerprint is unique, different from one other. Universality ,that means every person hold the individual characteristics of fingerprint.

The three basic patterns of fingerprint ridges are the arch, loop, and whorl

- An arch is a pattern where the ridges enter from one side of the finger, rise in the center forming an arc, and then exit the other side of the finger[13].
- The loop is a pattern where the ridges enter from one side of a finger, form a curve, and tend to exit from the same side they enter.
- In the whorl pattern, ridges form circularly around a central point on the finger. Scientists have found that family members often share the same general fingerprint patterns, leading to the belief that these patterns are inherited



2. Attendance Monitoring Model

Automatic attendance system using fingerprint verification technique. A fingerprint is captured by user interface, which are likely to be an optical solid state or an ultrasound sensor. Generally, there are two approaches are used for fingerprint verification system among them first one is Minutiae based technique, in which minutiae is represented by ending or termination and bifurcations. Other one is Image based method or matching pattern.

Minutiae-based matching: This is the most popular and widely used technique, being the basis of the fingerprint comparison made by fingerprint examiners. Minutiae are extracted from the two fingerprints and stored as sets of points in the two- dimensional plane. Minutiae-based matching essentially consists of finding the alignment between the template and the input minutiae sets that results in the maximum number of minutiae pairings[1]

Pattern or Image based matching: Pattern based matching use algorithms to compare the basic fingerprint patterns like arch, whorl or loop between a previously stored template and candidate fingerprint. For this purpose image is required to be alignment in same orientation. In matching process algorithms finds a central point on the fingerprint image and centre on the image. In pattern based algorithm, the template contains the type, size and orientation of pattern within the aligned fingerprint image. The candidate fingerprint image is graphically compared with the template to determine the degree to which the match.

3. Implementation Of Process

This process complete in three phase and also phase description is mention below:-

Phase 1. Fingerprint scanning and registration

Fingerprint scans convert people's fingerprints into digital codes or numerical data that can be recorded in a database. Like [facial recognition software](#), fingerprint scanning matches an individual's code against an existing database of codes in order to confirm that individual's identity. Proponents of fingerprint scanning point to the conversion of fingerprints into digital data as a privacy protection measure. Fingerprint scanning is already in use as an identification system that replaces cards or keys: to log onto computers. Before scanning the fingerprint everyone has to fill the registration form. These form have the some of the basic details of the individual such as name, father's name, mother's name, date of birth and so on.

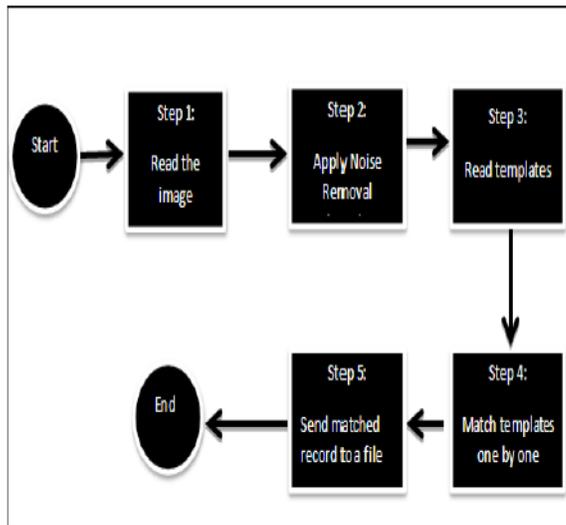
Fingerprint scanning



Registration form

PHASE-2:- Fingerprint recognition or authentication

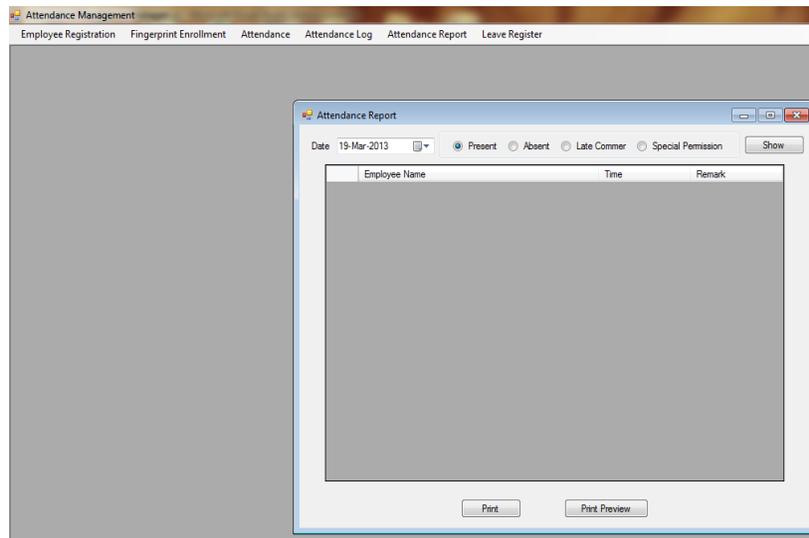
Fingerprint recognition or fingerprint authentication refers to the [automated](#) method of verifying a match between two human [fingerprints](#). Fingerprints are one of many forms of [biometrics](#) used to [identify](#) individuals and [verify](#) their [identity](#). This article touches on two major classes of [algorithms](#) (minutia and pattern) and four [sensor](#) designs (optical, ultrasonic, passive capacitance, and active capacitance). The analysis of fingerprints for matching purposes generally requires the comparison of several features of the print pattern. These include patterns, which are aggregate characteristics of ridges, and minutia points, which are unique features found within the patterns.^[1] It is also necessary to know the structure and properties of human [skin](#) in order to successfully employ some of the imaging technologies.[10]. Minutiae-based fingerprint matching algorithm has been proposed to solve two problems: correspondence and similarity computation. For the correspondence problem, use an alignment-based greedy matching algorithm to establish the correspondences between minutiae. Fingerprint recognition systems have the advantages of both ease of use and low cost.



Phase-3:-Attendance update:-

Employee Attendance Management software is tightly integrated with the organization's HR data. The in-time and out-time, lunch and breaks entered by the employees will help the respective authority in charge to keep in track the activities of the employees.

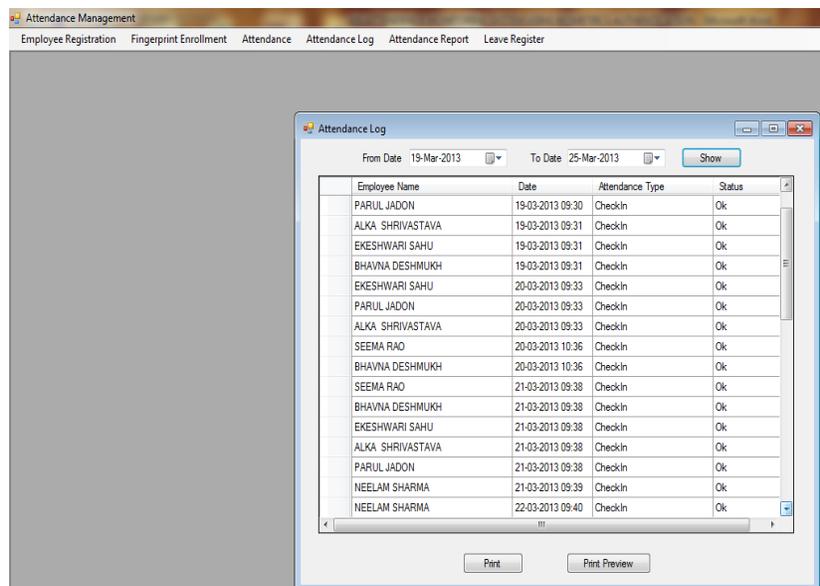
- Employee Attendance Management System helps in keeping track of the attendance of employees based on various events like shift, late, overtime, permission, holiday working and on duty.[5]
- Single click view of all time office events like hours worked, late, permission, on duty, overtime, leave of an employee for date or month period can also be obtained from this Attendance Management system.
- Employee Attendance Management Software helps to monitor the productivity of the employees and also keep a check on the Employee absenteeism which in turn helps in achieving the organization goals.



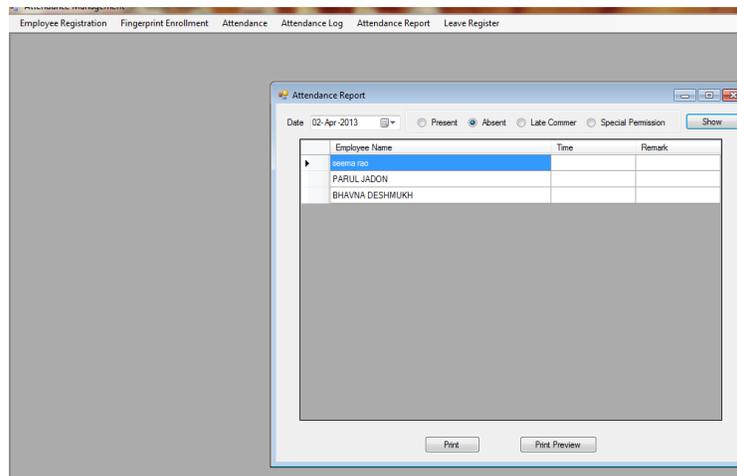
4. Result

The report will be generated with name of the employee matched fingerprint and stored in an attendance system.

Attendance log of the month is shown in below table:



This software not only prepare the monthly report but also shows the attendance of the individual day. It not only display the name of the present employees but it also display the employee which is absent or late on that particular day. This software also display the name of employees which is in preplan live. The individual attendance reports is shown below:



5. Conclusion And Future Work

The proposed system will make way for perfect management of students and staff attendance and produce more accuracy. Future work on this project would include the creating of a matching algorithm that uses to mention and maintain the different type of leave such as on duty leave, leave without pay, medical leave and soon. Also timely update the leave of the each employees when it take leave. The efficient matching algorithm have to be developed in theory and in code so that our goal of getting faster and more accurate matched image than with pre-existing software.

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