وزارة التعليم العالي والبحث العلمي
جـــامـــعـــة ديـــالـــى
كـــليـــة التربيـــة للعـــلوم الصـــرفة
قسم علوم الحاسوب

نظام تسجيل غياب الطلاب عن طريق بصمة الاصبع

مشروع تخرج مقدم الى قسم علوم الحاسوب/مقدم كلية التربية للعلوم الصرفة وهو جزء من متطلبات نيل شهادة البكالوريوس في علوم الحاسوب

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2019 م

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System of Absence Students using Fingerprint

A project

A project submitted to the department of computer Science at the college of Education of pure science in partial fulfillment of the requirements for the bachelor of science in computer science .

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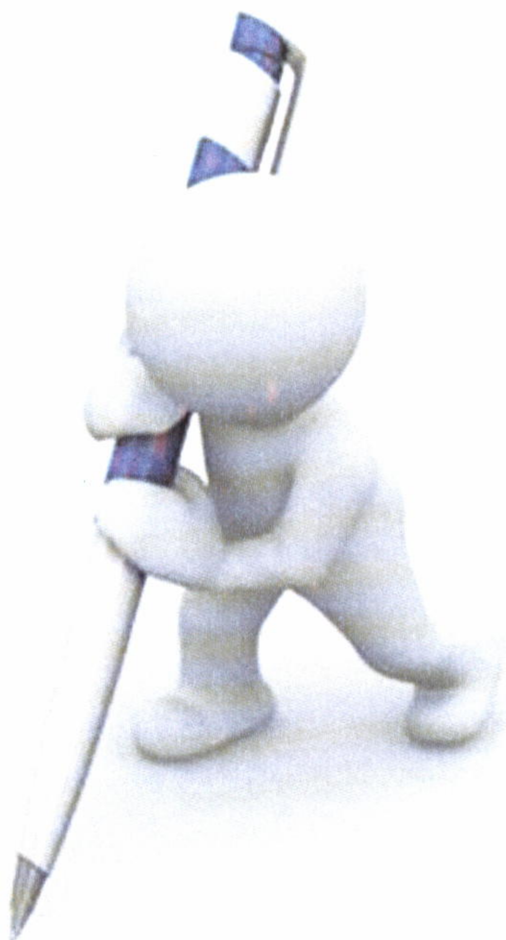


chapter one

Introduction

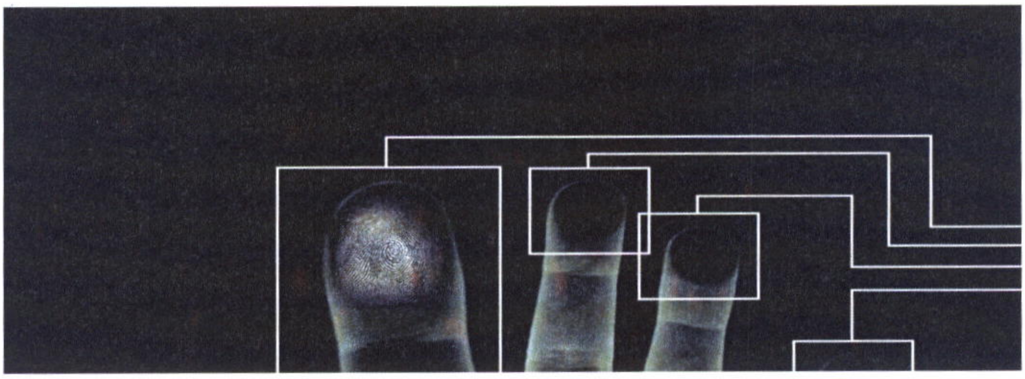
1.1-Introduction

Fingerprints figure(1.1) Have A Long History Of Use As A Means Of Reliably Identifying Individuals. Based On The Persistence And Uniqueness Of Fingerprints, Fingerprint Recognition Systems Have Become One Of The Most Popular Biometric Systems Used In Many Applications, Including Law Enforcement, Border Control, And Forensics. In This Chapter, The searcher Describe The Fingerprint Representation is At Three Levels Which Are Widely Used In Fingerprint Matching, And Explain Two Matching Scenarios In Fingerprint Recognition:

(i) Exemplar Fingerprint Matching That Compares Fingerprints Obtained In Ten Print Cards .

(ii) Latent Fingerprint Matching That Searches Latten's Found At Crime Scenes Against Exemplar Fingerprint Databases.

The searcher Discuss Challenging Contemporary Issues In Fingerprint Recognition, Including Latent Matching And Fingerprint Obfuscation, And Present The Contributions Of This Dissertation That Address These Issues.



[Figuer1.1] **fingerprint**

1.2- Background

The Use Of Biometric Systems Is Growing Every Day. Fingerprint Scanning Is The One Biometric Identification Method Available Today That Is Mostly Used. The Security Of Fingerprint Scanners figure(1.2) Has However Been Questioned And Previous Studies Have Shown That Fingerprint Scanners Can Be Fooled With Artificial Fingerprints, I.E. Copies Of Real Fingerprints. The Fingerprint Systems Are Evolving And This Study Will Discuss The Situation Of Today.

1.3- System Requirements

System Requires Working Properly And As Quickly As Desired, The Following Specifications For The Pc:

1. A Computer With A Processor (Inter (R) Core(TM)I3-3120M CPU @ 2.50ghz..

2. Random RAM Is Not Less Than 128M.

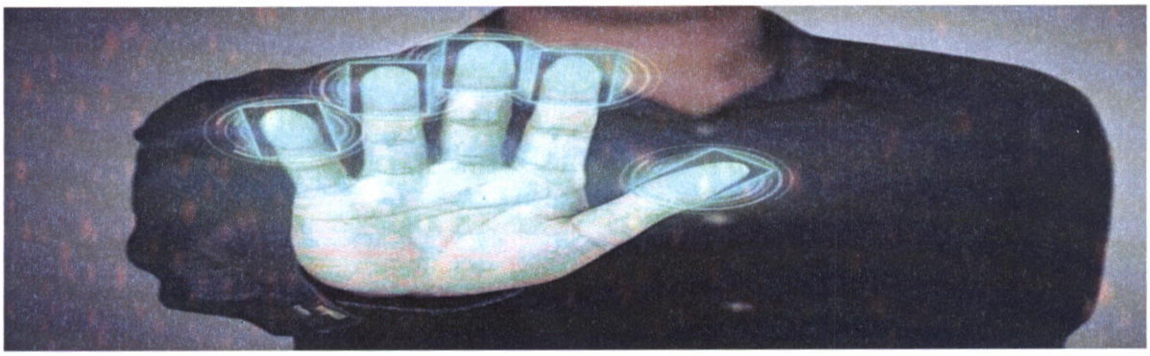
3. Screen Graphics (Graphics Card) With The Efficiency Of Not Less Than.

4. Run Windows XP And Windows XP System . 8M.

5. System Type: 32-Bit Operating System.

6. Computer Type: Hp.

7. Installed Memory (RAM): 4.00GB (2.45) GB.



[Figuer1.2] fingerprint scanner

1.4- The Beneficiary of the System:

1-All Student At Colleges And Institutes.

2-It Is Possible To Be The Beneficiaries Are The Photographers And Users Of Photoshop.

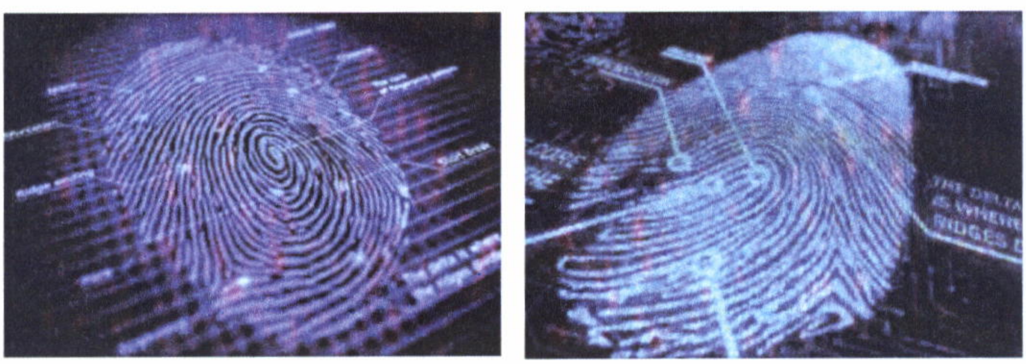
3-Mulat Of Art , That They Want To Modify Old Pictures.

4-Computer Science Student .

5-Web Site Designer .

1.5 Introduction to Fingerprint

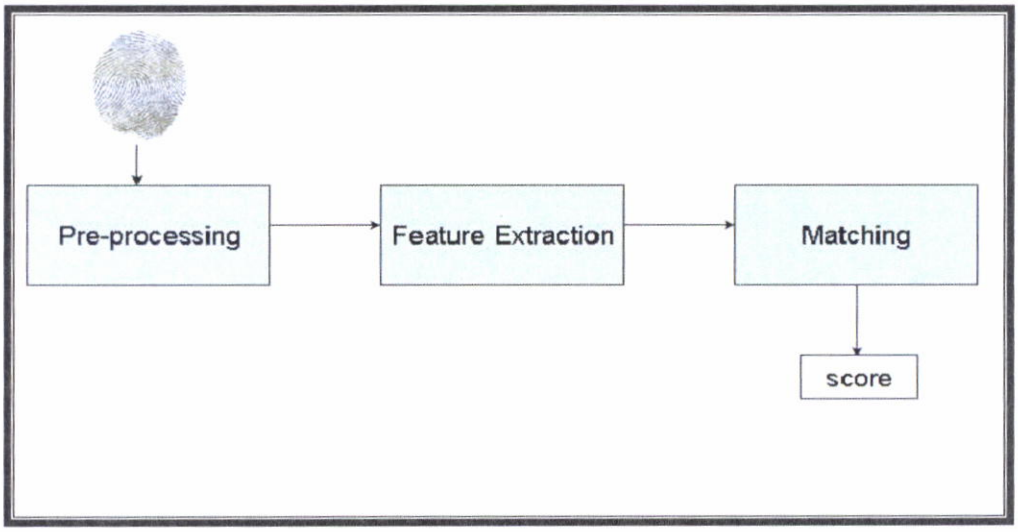
Fingerprint identification is one of the most well-known and Publicized biometrics. Figure(1.3) Because of their uniqueness and Consistency over time, fingerprints have been used for Identification for over a century, more recently becoming Automated (i.e. a biometric) due to advancements in computing Capabilities. Fingerprint identification is popular because of the Inherent ease in acquisition, the numerous sources (ten fingers) Available for collection, and their established use and collections by law enforcement and immigration.



[Figuer1.3] simple of fingerprint

1.6 State of the Art in Fingerprint Recognition

This section provides a basic introduction to fingerprint recognition systems and their main parts, including a brief description of the most widely used techniques and algorithms. A number of additional issues that are not in the scope of this book can be found in.



[Figuer1.4] shows Main modules of a fingerprint verification system.

The main modules of a fingerprint verification system (cf. Fig 1) are:

A) fingerprint sensing, in which the fingerprint of an individual is acquired by a fingerprint scanner to produce a raw digital representation;

B) preprocessing , in which the input fingerprint is enhanced and adapted to simplify the task of feature extraction;

C) Feature extraction, in which the fingerprint is further processed to generate discriminative properties, also called feature vectors; and

D) Matching, in which the feature vector of the input fingerprint is compared against one or more existing templates. The templates of approved users of the biometric system, also called clients, are usually stored in a database. Clients can claim an identity and their fingerprints can be checked against stored fingerprints.

1.7 Fingerprint Sending

Fingerprint sensing figure (1.5). techniques can be of two types – off-line scanning and live-scanning. In off-line sensing fingerprints are obtained on paper by "ink technique" which are then scanned using paper scanners to produce the digital image Most AFISs use live-scanning where the prints are directly obtained using an electronic fingerprint scanner. Almost all the existing sensors belong to one of the three families: optical, solid-state, and ultrasound.

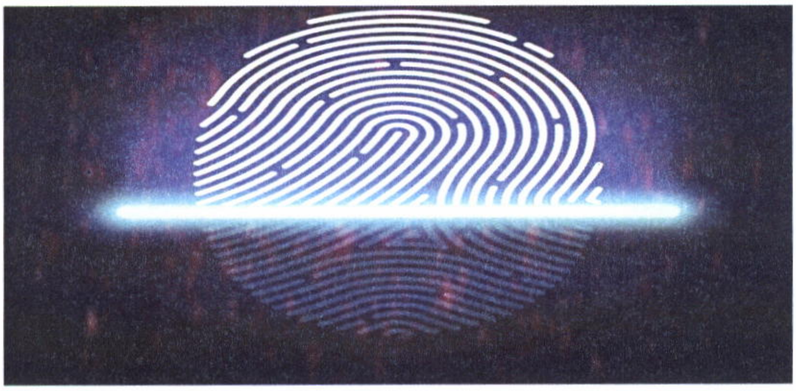
- Optical sensors: based on the frustrated total internal reflection (FTIR) technique are commonly used to capture live-scan fingerprints in forensic and government applications. They are the most common fingerprint sensor. An important breakthrough in sensor technology was the development of optical sensors based on fiber-optics as described in the US patent, leading to sensor miniaturization and enhanced portability. Solid-state touch and sweep sensors silicon-based devices that measure the differences in physical properties such as capacitance or conductance of the friction ridges and valleys dominate in commercial applications. Taranga and Guarneri describe a feedback capacitive sensing scheme using a 200x200 element sensor array implement in standard 2-metal CMOS technology. Jean-Woo Lee discusses another such solid-state sensor, based on capacitive differences, capable of producing

600dpi fingerprints. Many commercially available sweep sensors like Fujitsu MBF320 are based on such low-power solid-state devices. A special case of off-line sensing is the acquisition of a latent fingerprint from a crime. Used extensively in forensics, latent prints are accidental impressions left by friction ridge skin on a surface, due to natural secretions of the accrue glands present on skin. While tremendous progress has been made in plain fingerprint matching, latent fingerprint matching continues to be a difficult problem. Poor quality of ridge impressions, small finger area, and large non-linear distortion are the main difficulties in latent fingerprint matching, compared to plain fingerprint matching. The acquisition of fingerprint images has been historically carried out by spreading the finger with ink and pressing it against a paper card. The paper card is then scanned, resulting in a digital representation. This process is known as off-line acquisition and is still used in law enforcement applications. Currently, it is possible to acquire fingerprint images by pressing the finger against the flat surface of an electronic fingerprint sensor. This process is known as online acquisition. There are three families of electronic fingerprint sensors based on the sensing technology:

- **Solid-state or silicon sensors: These consist of an array of pixels, each pixel being a sensor itself. Users place the finger on the surface of the silicon, and four techniques are typically used to convert the ridge/valley information into an electrical signal: capacitive, thermal, electric field and piezoelectric. Since solid-state sensors do not use optical components, their size is considerably smaller and can be easily embedded. On the other hand, silicon sensors are expensive, so the sensing area of solid-state sensors is typically small.**
- **Optical: The finger touches a glass prism and the prism is illuminated with diffused light. The light is reflected at the valleys and absorbed at the ridges.**

The reflected light is focused onto a CCD or CMOS sensor. Optical fingerprint sensors provide good image quality and large sensing area but they cannot be miniaturized because as the distance between the prism and the image sensor is reduced, more optical distortion is introduced in the acquired image.

Ultrasound: Acoustic signals are sent, capturing the echo signals that are reflected at the fingerprint surface. Acoustic signals are able to cross dirt and oil that may be present in the finger, thus giving good quality images. On the other hand, ultrasound scanners are large and expensive, and take some seconds to acquire an image A new generation of touch less live scan devices that generate a 3D representation of fingerprints is appearing. Several images of the finger are acquired from different views using a multi camera system, and a contact-free 3D representation of the fingerprint is constructed. This new sensing technology overcomes some of the problems that intrinsically appear in contact-based sensors such as improper finger Placement, skin deformation, sensor noise or dirt.

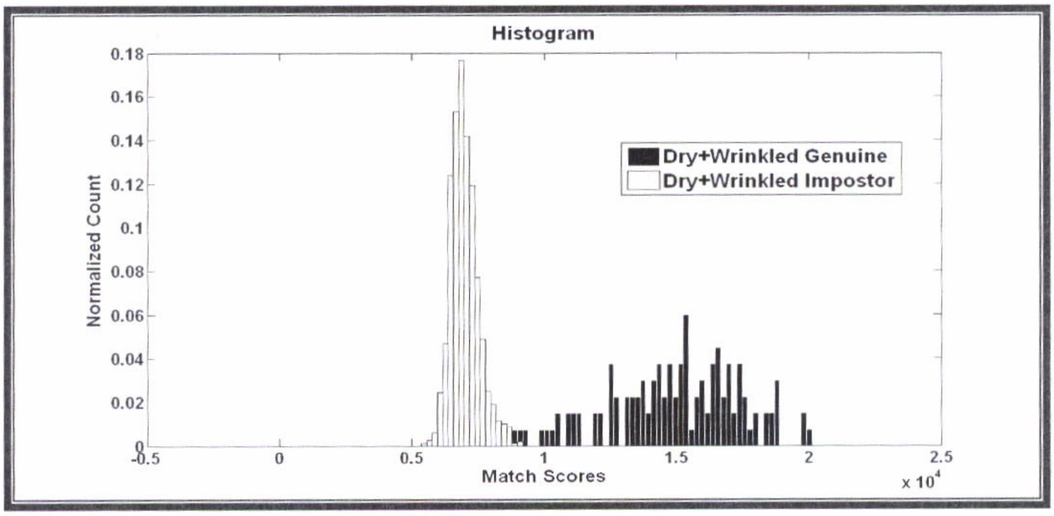


[Figure 1.5] Fingerprint image

1.8 Fingerprint Reader

To acquire fingerprint samples, we obtained a fingerprint reader equipped with high-end multispectral imaging technology. The configuration of the multispectral sensor is particularly designed to avoid the Total Internal Reflection (TIR) phenomena by orienting the light source such that the relevant angles do not exceed any critical-angle conditions.

This is certainly a valuable characteristic for the purpose of our project since it adds more to the image quality and the robustness of the data acquisition process. The designated fingerprint reader includes a user friendly Software Development Kit (SDK) that allows us to store the samples as bitmap files on our computer. This is highly valuable. The black bars represent the range and frequency of genuine sores acquired under dry and wet conditions, and the white bars represent the combination of the impostor scores collected under both dry and wet conditions.



[Figure 1.6] A match score histogram for dry scores as well as wrinkled.

1.9 FINGERPRINT FEATURES

A fingerprint is an impression of the epidermal ridges of a human fingertip. A hierarchy of three levels of features, namely, Level 1 (pattern), Level 2 (minutiae points) and Level 3 (pores and ridge shape) are used for recognition purposes. Most AFISs employ Level 1 & Level 2 features.

Level 1 figure (1.7) features refer to the overall pattern shape of the unknown fingerprint—a whorl, loop or some other pattern. This level of detail cannot be used to individualize, but it can help narrow down the search.

Level 2 figure (1.7) features refers to specific friction ridge paths — overall flow of the friction ridges and major ridge path deviations (ridge characteristics called minutiae) like ridge endings, lakes, islands, Bifurcations, scars, incipient ridges, and flexion creases .

Level 3 figure (1.7) detail [14] refers to the intrinsic detail present in a developed fingerprint — pores ridge units, edge detail, scar etc. High resolution sensors (~1000dpi) are required for extraction of Level 3 features. But as [8] shows, EER values are reduced (relatively ~20%) using them along with Level 1 & 2 features. Moreover Level 3 features offer greater success in partial fingerprint recognition.

a-Level 1 b-level 2 c-level 3

[Figure 1.7]

1.10 Fingerprint Matching

In the matching step, features extracted from the input fingerprint are compared against those in a template, which represents a single user (retrieved from the system database based on the claimed identity). The result of such a procedure is either a degree of similarity (also called matching score) or an acceptance/rejection decision.

There are fingerprint matching techniques that directly compare gray scale images (or sub images) using correlation-based methods, so that the fingerprint template coincides with the gray scale image. However, most of the fingerprint matching algorithms use features that are extracted from the gray scale image. One of the biggest challenges of fingerprint recognition is the high variability commonly found between different impressions of the same finger. This variability is known as interclass variability and is caused by several factors, including:

a)Displacement or rotation between different acquisitions.

b) Partial overlaps, especially In sensors of small area.

c) Skin conditions, due to permanent or temporary factors 60 F. Alonso-Fernandez, J. Begun, J. Ferret et al.(cuts, dirt, humidity, etc.).

d) Noise in the sensor (for example, residues from previous acquisitions)

e) Nonlinear distortion due to skin plasticity and differences in pressure against the sensor. Fingerprint matching remains as a challenging pattern recognition problem due to the difficulty in matching fingerprints affected by one or several of the mentioned factors.

A large number of approaches to fingerprint matching can be found in literature.

They can be classified into:

a) correlation-based approaches,

b) minutiae-based approaches, and

c) Ridge feature-based approaches.

In the correlation-based approaches, the fingerprint images are superimposed and the gray scale images are directly compared using a measure of correlation. Due to nonlinear distortion, different impressions of the same finger may result in differences of the global structure, making the comparison unreliable. In addition, computing the correlation between two fingerprint images is computationally expensive.

To deal with these problems, correlation can be computed only in certain local regions of the image, which can be selected following several criteria. Also, to speed up the process, correlation can be computed in the Fourier domain or using heuristic approaches, which allow the number of computational operations to be reduced.

Minutiae-based approaches are the most popular and widely used methods for fingerprint matching, since they are analogous with the way that forensic experts compare fingerprints. A fingerprint is modeled as a set of minutiae, which are usually represented by its spatial coordinates and the angle between the tangent to the ridge line at the minutiae position and the horizontal or vertical axis.

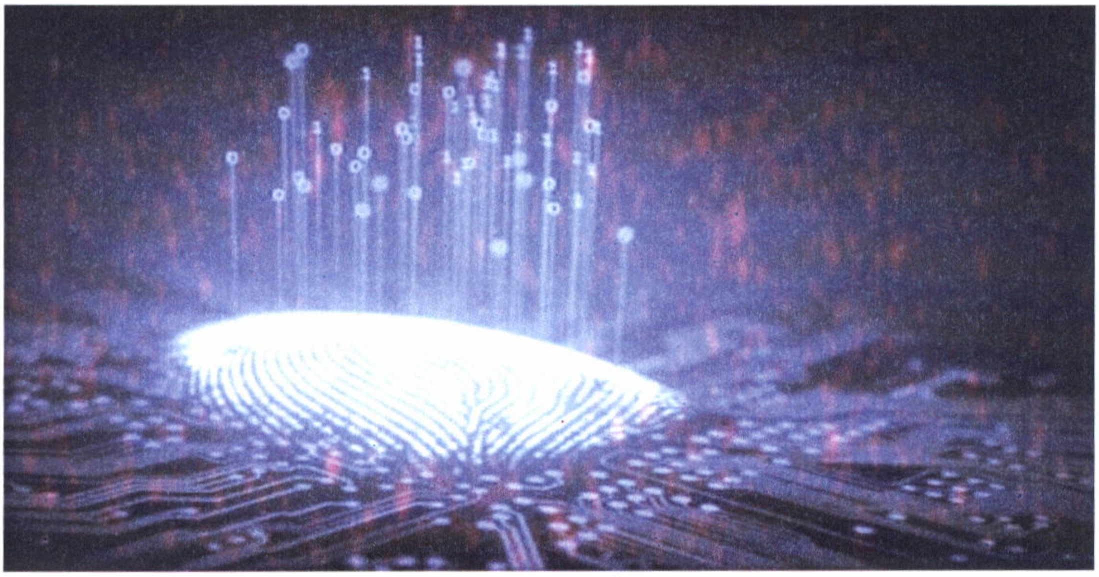
The minutiae sets of the two fingerprints to be compared are first aligned, requiring displacement and rotation to be computed (some approaches also compute scaling and other distortion-tolerant transformations). This aligns a meant in voles a minimization problem, the complexity of which can be reduced in various ways. Once aligned, corresponding minutiae at similar positions in both fingerprints are looked for. A region of tolerance around the minutiae position is defined in order to compensate for the variations that may appear in the minutiae position due to noise and distortion. Likewise,

differences in angle between corresponding minutia points are tolerated. Other approaches use local minutia matching, which means combining comparisons of local minutia configurations. These kinds of techniques relax global spatial relationships that are highly distinctive but naturally more vulnerable to nonlinear deformations. Some matching approaches combine both techniques by first carrying out a fast local matching and then, if the two fingerprints match at a local level, consolidating the matching at global level. Unfortunately, minutiae are known to be unreliably extracted in low image quality conditions. For this and other reasons, alternative features have been proposed in the literature as an alternative to minutiae (or to be used in conjunction with minutiae). The alternative feature most widely studied for fingerprint matching is texture information. The fingerprint structure consists of periodical repetitions of a pattern of ridges and valleys that can be characterized by its local orientation, frequency, symmetry, etc. Texture information is less discriminative than minutiae, but More reliable under low quality conditions.

1.11 Fingerprint characteristics

You have probably looked at your own fingerprint at some point in your life and noticed the papillary lines on it figure(1.8). In fingerprint literature, the terms ridges and valleys are used to describe the higher and lower parts of the papillary lines. There as on we have ridges and valleys on our fingers, is the frictional ability of the skin The formation of the ridges and valleys is a combination of genetic and environ-mental factors. The DNA gives directions in the formation of the skin of the fetus, but the exact formation of the fingerprint is a consequence of random events. The exact position of the fetus in the womb at a particular moment, and the exact composition and density of

surrounding amniotic fluid, decide how every individual ridge will form This is also the reason why the fingerprints on different fingers on the same individual are different, and why identical twins have different fingerprints.



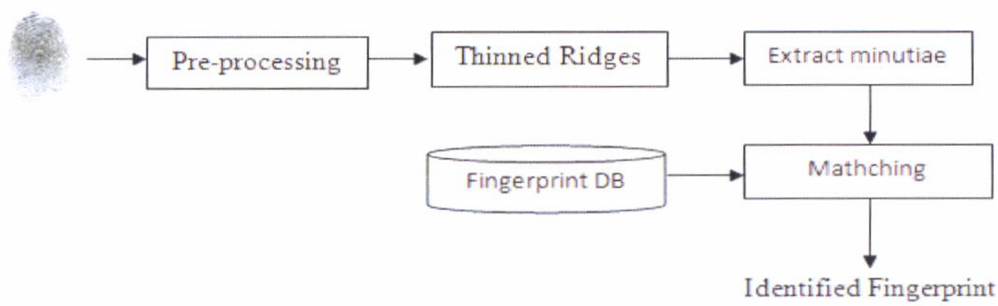
[Figure1.8] fingerprint image

1.11.1 Classification and pattern types

Fingerprints can be and have been classified in different ways throughout history. The Henry Classification System was the basis of modern day AFIS classification methods up until the 1990s. In recent years, the Henry Classification System has in most forensic departments been replaced by ridge flow classification approaches. These new classification methods use the distance between core and delta points, minutiae locations, and pattern type (the latter using the Henry Classification System). Fingerprints can be divided into the three major pattern type's arches, loops, and whorls. Loops are the most common fingerprint pattern.

These major pattern types can appear in different variations. For example you can find plain or tented (narrow) arches, right or left loops, and spiral or concentric circles as whorls. Also, the different pattern types can be combined to form fingerprint, e.g. a double loop, or an arch with a loop. The three major pattern types: arches, loops, and whorls.

These major pattern types can be divided further into different subgroups: right or left loops, plainer tented (narrow) arches, and spiral or concentric circles as whorls. There are also combinations of these different pattern types.



[Figure 1.9]

Fingerprint Recognition process

1.12 Fingerprint scanners

Traditional Even though the first fingerprint scanners were introduced more than 30 years ago, it is not until the recent years that the interest for fingerprint scanning has increased considerably. With the terrorist attack in New York on September 11 , 2001 , the US Government and other governments and organizations, became increasingly interested in the biometrics industry. Passport, border control, and identification cards are areas were fingerprints, as a means of authentication, have become in-caressingly interesting. The fingerprint scanner market has grown rapidly the

last years. With this development, the scanners are shrinking in size, the price is going down, and fingerprint systems are being integrated into electronic equipment such as laptops, mouse, and keyboards A fingerprint scanner has basically two tasks; to acquire an image of a fingerprint, and to decide whether or not this image matches the image of a previously enrolled fingerprint. The decision phase is done by extracting features from the image and then comparing these features to templates stored in a database. A fingerprint contains a lot of information. Storing and using all this information, would take too much space and unnecessary effort when a lot of the information in fact is redundant. Instead, fingerprint scanners focus on the essential information to make the fingerprint as unique as possible and thus useful in identification and verification situations.

This chapter will describe the characteristics of a digital fingerprint image; the different scanning techniques used today, the algorithms behind the surface of the scanners, protection schemes, and possible ways of intrusion.

1.13 Fingerprint Image

A fingerprint is the feature pattern of one finger. Each person has his own fingerprints with the permanent uniqueness. Due to the uniqueness and permanence of fingerprints, they are among the most reliable human characteristics that can be used for personal identification.

1.13.1 Image Acquisition

A number of methods are used to acquire fingerprints. Among them, the inked impression method remains the most popular one. Inkless fingerprint scanners are also present eliminating the intermediate digitization process. Fingerprint quality is very important since it affects directly the minutiae extraction algorithm The size of the scanned fingerprints that are used in this research is 188x240 pixels. The images are taken in this size in order to ease the computational burden.

1.13.2 Fingerprint Image Processing

Processing of fingerprint image is necessary to:

(i) improve the clarity of ridge structures of fingerprint images

(ii) maintain their integrity,

(iii) avoid introduction of spurious structures or artifacts, and

(iv) **Retain the connectivity of the ridges while maintaining separation between ridges. Fingerprint image processing operations are image enhancement, image normalization and image binarazation.**

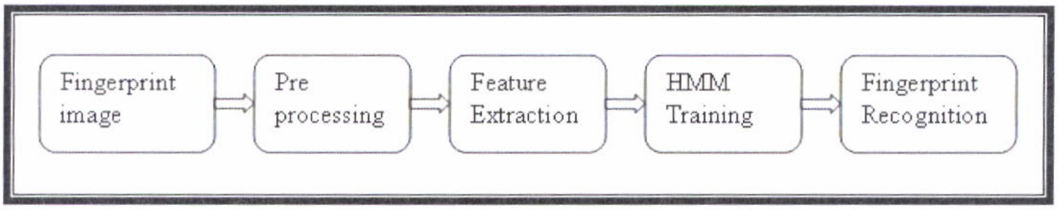
1.14 Fingerprint Recognition System (FRS)

The Fingerprint Recognition system (FRS) uses following four steps to recognize the given fingerprint image (Flowchart 1.1).

i) Preprocessing

ii) Feature extraction

iii) HMM training



Flowchart 1.1 : Fingerprint Recognition System using HMM

The preprocessing involves some processes such as remove background, reduces noise exist on image, enhance the definition of ridges against valleys and produces the clear thinned minutia. A fingerprint image may be one of the noisiest of image types. This is due to the fact that finger tips become dirty, cut, scarred, creased, dry, wet, worn, etc. The image enhancement step is designed to reduce this noise and to enhance the clear definition of ridges against valleys. Two image processing operations designed for these purposes are the adaptive matched filter and adaptive three holding. Even though there may be discontinuities in particular ridges, one can always look at a local area of ridges and determine their flow. This filter is applied to every pixel in the image. Based on the local orientation of the ridges around each pixel, the matched filter is applied to enhance ridges oriented in the same direction as those in the same locality, and decrease anything oriented differently. The incorrect ridges can be eliminated by use of the matched filter From the enhanced minutia, minutia points (features) are extracted using feature extraction techniques. The fingerprint minutiae are found at the feature extraction stage. Operating upon the thinned image, the minutiae are straightforward to detect. Endings are found at termination points of thin lines. Bifurcations are found at the junctions of three lines. There will always be extraneous minutiae found due to a noisy original image or due to artifacts introduced during matched filtering and thinning. These extraneous features

are reduced by using empirically determined thresholds. For instance, a bifurcation having a branch that is much shorter than an empirically determined threshold length is eliminated. Two endings on a very short isolated line are eliminated because this line is likely due to noise. Two endings that are closely opposing are eliminated because these are likely to be on the same ridge that has been broken due to a scar or noise or a dry finger condition that results in discontinuous ridges. Endings at the boundary of the fingerprint are eliminated because they are not true endings but rather the extent of the fingerprint in contact with the capture device. Feature attributes are determined for each valid minutia found. The extracted feature of fingerprint is accepted by the pseudo 2D HMM to classify fingerprint image separately according to the pattern type such as right loop, left loop, whorl and arch.

1.15 Fingerprint Image Enhancement

The local ridge orientation is an intrinsic property of the fingerprint images figure(1.10). By viewing a fingerprint image as an oriented texture, a number of methods have been proposed to estimate the orientation field of fingerprint images. The previous enhancement algorithm is either local orientation field filter-based or Gabor filter-based .The orientation field filtering techniques usually assume the local ridge orientation could be reliably estimated and be taken advantage to enhance the fingerprint image. The ridge structures in poor-quality fingerprint images are not always well-defined and, hence, the orientation information could not be correctly detected, which greatly restricts the applicability of these techniques . The Gabor filter based technique could obtain a reliable orientation estimate even for corrupted

images. It is unsuitable for an on-line fingerprint recognition system such as AFIS because the algorithm is computationally expensive.

[Figure1.10] fingerprint image

1.16 Training

Since the outputs may not be what is expected, the weights may need to be altered. Some rule then needs to be used to determine how to alter the weights. There should also be a criterion to specify when the process of successive modification of weights ceases. This process of changing the weights, or rather, updating the weights, is called training. A network in which learning is employed is said to be subjected to training. Training is an external process or regimen. Learning is the desired process that takes place internal to the network. The training steps are as follows:

1. The first input (training) pattern is presented to the network.
2. The connections are adjusted a tiny amount to improve the network's chances of recognizing that pattern if it sees it again.
3. The second pattern is presented, and step 2 repeated.

4. The same thing happens for all the training patterns.

5. The whole process is rerun with all the training Patterns for hounds (thousands) of times.

1.17 The Objective of System:

1. **Distinguish Fingerprint From Each Other, By Extracting A Special Number For Each Fingerprint Is Not Like Other Number Imprint.**

2. **Also Find Out The Name And The Age And Sex Of The Person Is The Owner.**

3. **Use Of Visual Basic To Programming The Distinguish fingerprints.**

chapter two

Literature review

[Dev Nath,et.al.2004] attempt to give a comprehensive scoping of the fingerprint recognition problem and implementation issues as well as give an insight into its future prospects , and their preliminary analysis shows that fingerprints have been proven to be an excellent if not the best biometric and its potential has not yet been fully realized. But still, issues such as fingerprint authentication at a distance, real-time identification in large-scale applications with billions of fingerprint records, developing secure and revocable fingerprint templates that preserve accuracy, and scientifically establishing the uniqueness of fingerprints will likely remain as grand challenges in the near future.

[Dr.kalyani mali,et.al.2003]describes an on-line fingerprint identification system consisting of image acquisition, edge detection, thinning, feature extractor and classifier. The preprocessing part includes steps to acquire binaries and skeletonized ridges, which are needed for feature point extraction. Feature points (minutia) such as endpoints, bifurcations, and core point are then extracted, followed by false minutia elimination. their approach is based on minutiae located in a fingerprint. they want to implement the fingerprint identification system based on a different approach, namely frequency content and ridge orientation of a fingerprint. The minutiae based matching is highly sensible, as, if the finger is moved even a little bit that gives us a different set of minutiae.

[Farah Dhib Tatar& Mohsen machhout.1995] propose in this article an image preprocessing procedure in order to improve its quality before extracting the necessary information for the comparison phase. They have proposed in this article a set of operations to apply to the image in order to increase its quality to be able to facilitate the different phases of treatment that follow. The results obtained are motivating in terms of total error rate reduction, however, the total processing time remains directly related to the type of hardware platform used.

[Er. Shikha Tuteja,et.al.2007]In this paper they define the various aspects and methods to be used for. the fingerprint-based identification system, and In this paper, they have shown different methods and techniques which can be used to identify a person through its fingerprint. These mentioned methods conclude that the fingerprint is fast and accurate for more reliable and secure system.

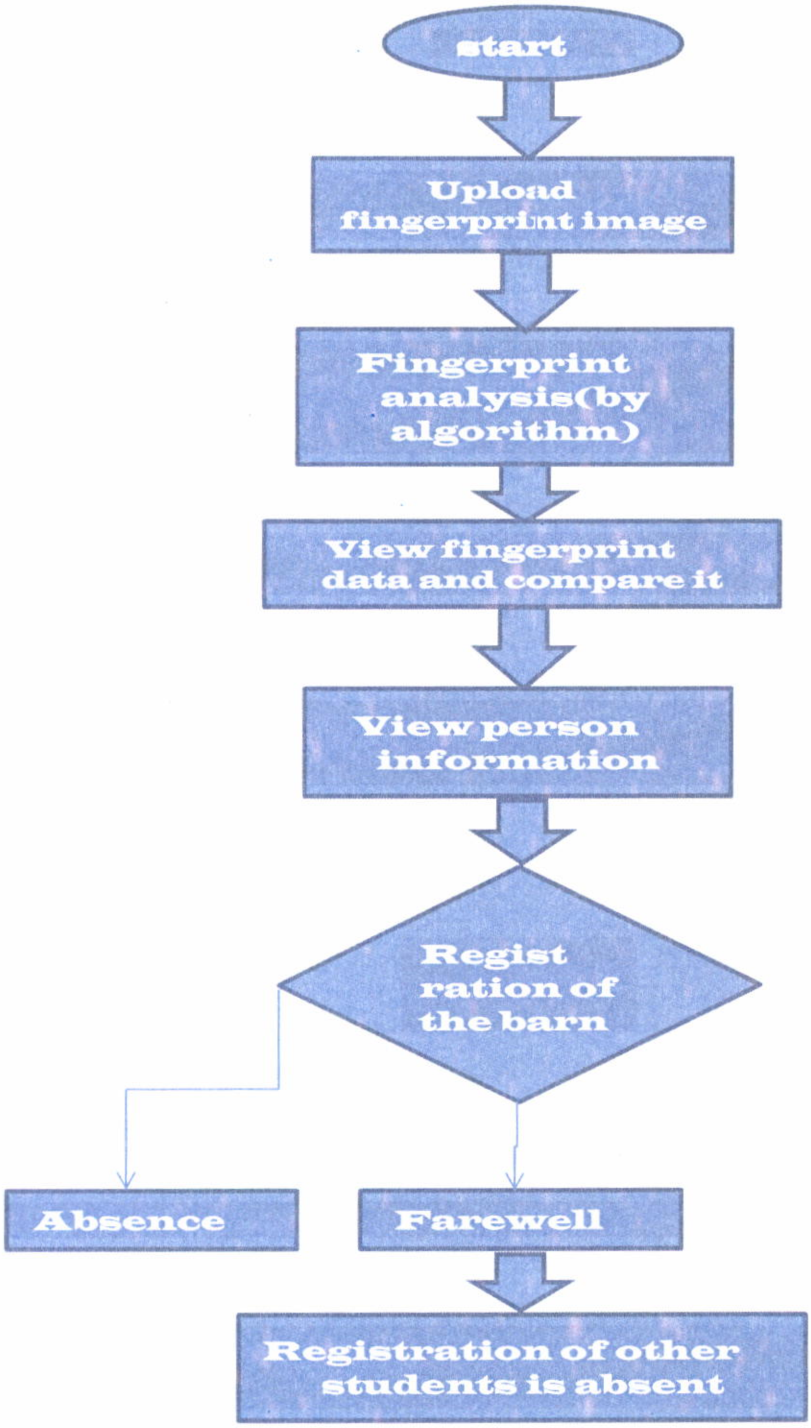
[Le Hoang Thai & Ha Nhat Tam.1997] In this paper they proposed a fingerprint-matching approach, which is based on standardized fingerprint model to synthesize fingerprint from original templates.
From the fingerprint templates of finger in the database, we chose one as mean images and use Genetic Algorithms in [9] to find the transformation among them. Then, these transformations is used to synthesize fingerprints (add ridges and minutiae from original template to mean fingerprint). Finally, they perform matching between mean fingerprint and other templates (FVC2004 DB4 database, which has poor-quality fingerprints) to show the capability of the model.

chapter three

Search Methodology

3.1 Flow chart

(One by one steps involved fingerprint analysis and recording absences for students).



3.2 The first interface :-

Welcome interface include the name of the search , the name of the student and the administrators of the system .

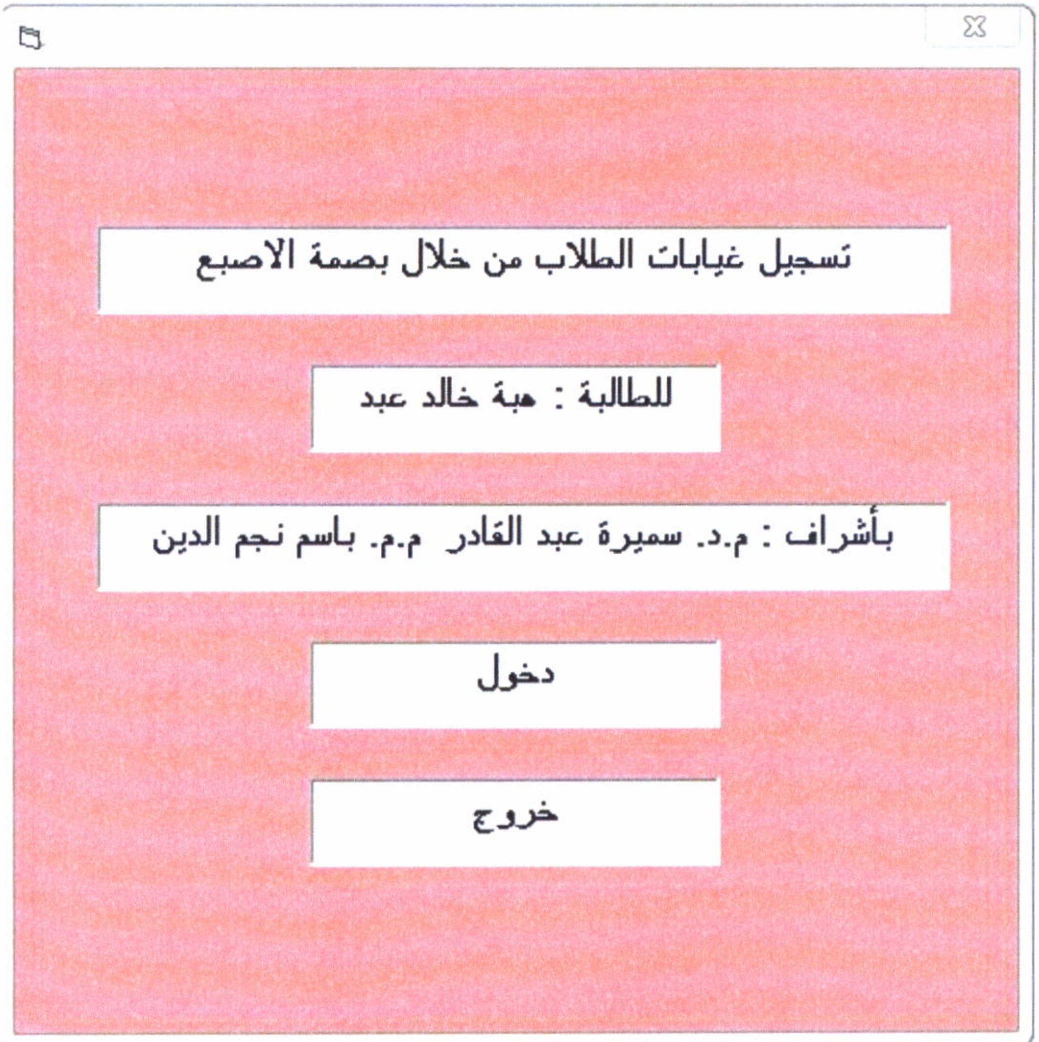
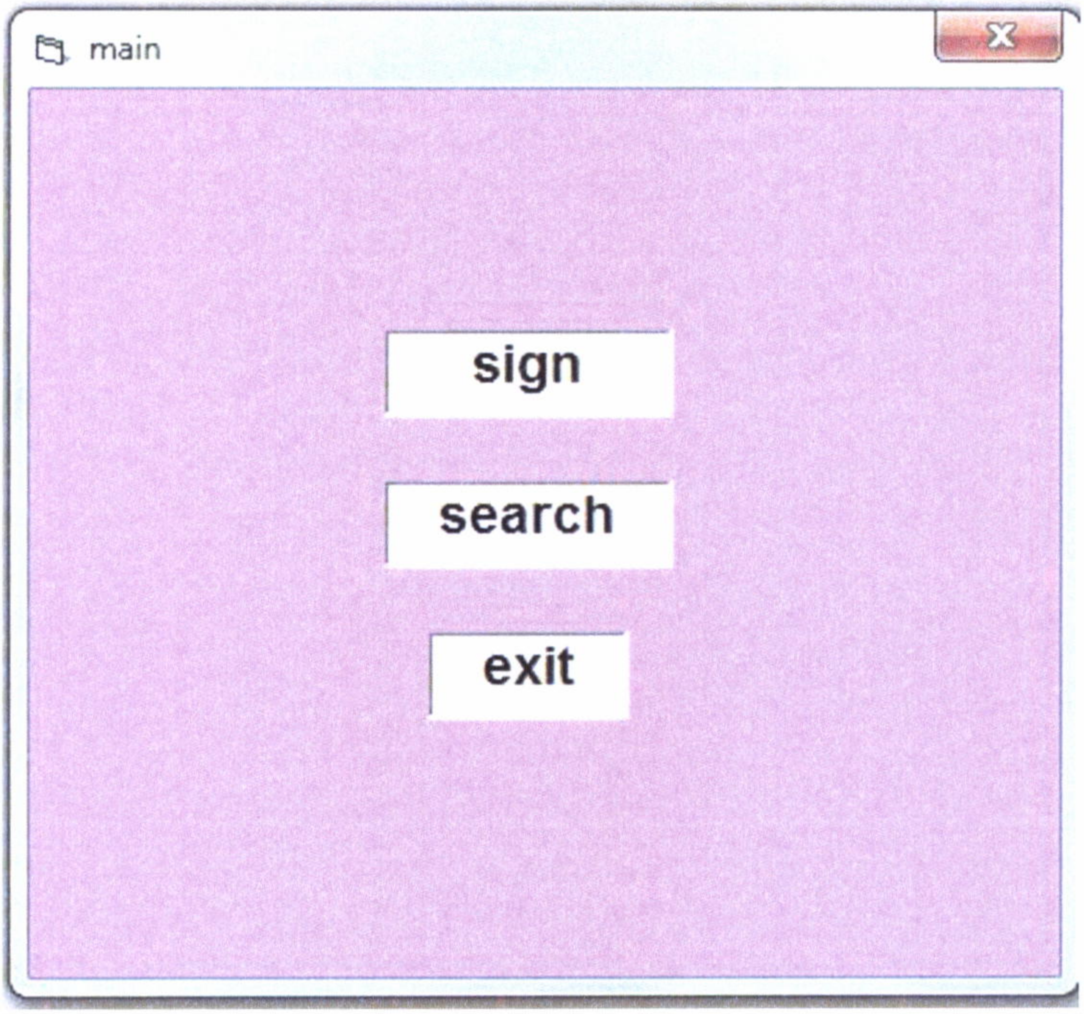


Figure [3.1]

3.3 The main interface

It includes three buttons, The first button(sign):-
When pressed will enter us to the interface of recording absence.
The Second button (search) search button :-
When pressed , it will take us to the search interface for absentee records for students.



Figure[3.2]

Figure[3.3]

3.4 Registration interface:-

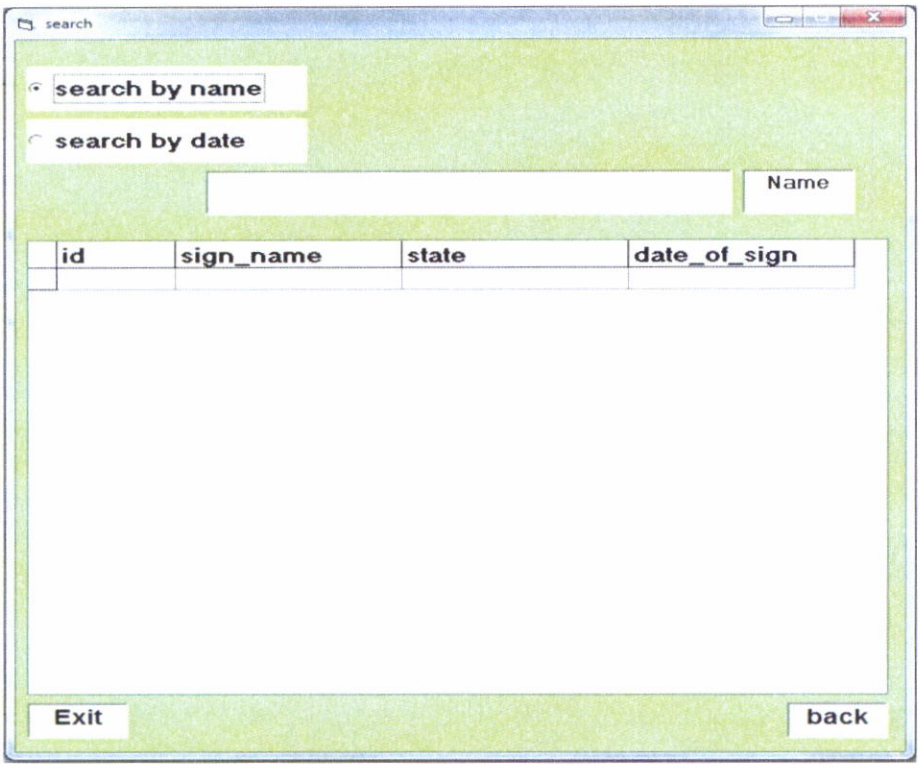
for absences through which to register absence .
By inserting a fingerprint by raising the image of the fingerprint or pressure .
On the load picture and choose the image of the footprint and then draw the image of the footprint by pressing the(draw) button .
The fingerprint is then analyzed by pressing the(Recognition) button.
Then a fingerprint key will be displayed and displays information(person's name, age, gender)
When the(sign)button is pressed ,its attendance will be recorded and so on until the attendance is recorded only.
when you press the (complete sign) the rest of the student will be absent .
New image after processing :-
Displays fingerprint images after analyzing them into three colors(RGB).
At the bottom of the page there are two lists :-

- On the left is a list containing the student's names in the hall .
- On the right is the list of absentee registration .

Exit :- is the exit button of the program.
Back :- is to return to the previous interface.

5.3 Search window :-

Through which the absence of a particular student can be displayed .The records of his or her attendance are searched either by name or date download.



Figure[3.4]