CHAPTER 6

EXPERIMENTAL RESULTS

6.1 DISCUSSIONS

The hierarchical and parallel phase based matching algorithms are applied to database and tested for every image in the CASIA database and some of the images in the IIT-D database. In this Chapter the results obtained are displayed. The analysis and comparison of the performance of the obtained results are discussed in the next chapter.

ODBC (Open Database Connectivity) is a standard C programming language interface for accessing database management systems (DBMS). An application can use ODBC to query data from a DBMS, regardless of the operating system or DBMS it uses. Microsoft Access is a database management system that combines the relational Database Engine with a graphical user interface and software-development tools. We Choose the Ms Access Database in Fig 6.1.

![Choosing Ms Access Database](image_url)

Fig 6.1 Choosing Ms Access Database
“dBase” is database management system for microcomputers. It is a relational database management system. dBase has evolved into a modern object oriented language that runs on 32 bit Windows. It can be used to build a wide variety of applications including web apps hosted on a Windows server, Windows rich client applications, and middleware applications. dBase can access most modern database engines via ODBC drivers. We provide the Database Source Name along with the description in Fig 6.2.

![ODBC dBASE Setup](image)

**Fig 6.2 Setting up the database**

All the storage information such as Iris number, Source information and Personal information is recorded in the Database. We make use of Matlab which serves as the front end and stores the entire information provided by the user. The front end of the system is designed in such a way that the user can input an image and pupil center and inner boundary can be extracted.
Fig 6.3 Storage of Images in the Database

Fig 6.4 represents Training Phase in which the user can input an image and recognize the Iris and fetch the effective region (Pupil Center and Inner Boundary) so that the processing becomes effortless.

Fig 6.4 Iris Preprocessing
The Iris has been localized and it becomes very easy to spot the exact location of the Iris which is represented in 6.5. From the process of Localization the Inner and the outer boundary regions are obtained.

![Fig 6.5 Output of Iris Localization](image)

After the effective region was determined all the unwanted regions have been lay aside from the view. Fig 6.6 represents the making region to be avoided.

![Fig 6.6 Marking of Region to be avoided](image)
All the stored information is recorded and effective region has been isolated and it becomes very easy to spot the Iris center and the outer boundary. The region is lowered and region of interest is shown in Fig 6.7.

Fig 6.7 Screen shot of localization and Region of Interest
All the information is recorded successfully; preprocessing completion is notified in Fig 6.8. Training phase is completed here and all the information is processed into the system.

Fig 6.8 Preprocessing Completion Notification

Fig 6.9 represents the various sub regions for extraction and the sub region which are used for parallel and hieratical face based matching methods.

Fig 6.9 Subregions for extraction
Fig 6.10 represents the five sub region extractions. These sub regions are made use for further matching process.

Fig 6.11 represents the phase components of the subregions extracted after undergoing the 2D Discrete Fourier Transform.

Fig 6.12 represents authentication of an Iris using parallel phase based matching sample. The Subject is authenticated. The matched iris number is displayed and it is classified using parallel Phase based matching.
The phase components of the subregions are subjected to the matching process. Unlike password-based systems, where a perfect match between two alphanumeric strings is necessary in order to validate a user’s identity, a biometric system seldom encounters two samples of a user’s biometric trait that result in exactly the same feature set. This is due to imperfect sensing conditions (e.g., noisy fingerprint due to sensor malfunction), alterations in the user’s biometric characteristic (e.g., respiratory ailments impacting speaker recognition), changes in ambient conditions (e.g., inconsistent illumination levels in face recognition) and variations in the user’s interaction with the sensor (e.g., occluded iris or partial fingerprints).

Fig 6.12 Authentication of an Iris using Parallel Phase Based Matching-Sample Screen shot
6.2 SUMMARY

Thus, seldom do two feature sets originating from the same biometric trait of a user look exactly the same. In fact, a perfect match between two feature sets might indicate the possibility that a replay attack is being launched against the system. The variability observed in the biometric feature set of an individual is referred to as *intra*-class variation, and the variability between feature sets originating from two different individuals is known as *inter*-class variation. A useful feature set exhibits small intra-class variation and large inter-class variation. The degree of similarity between two biometric feature sets is indicated by a similarity score. A similarity match score is known as a *genuine* or *authentic* score if it is a result of matching two samples of the same biometric trait of a user. It is known as an *impostor* score if it involves comparing two biometric samples originating from different users. An impostor score that exceeds the threshold $\eta$ results in a false accept (or, a false match), while a genuine score that falls below the threshold $\eta$ results in a false reject (or, a false non-match).