CHAPTER 8

CONCLUSION & FUTURE SCOPE

8.1 CONCLUSION

In this thesis, new algorithms are developed to deal with various applications in biometrics. A novel scheme and new algorithms are proposed for automatically detecting and recognizing human subjects via their eye traits (Iris). Recently, the phase based image matching has become popular for its robustness and accuracy. Hence the need of such advanced algorithms is more to process and recognize the biometrics traits. The thesis focuses to

i) identify and extract the subregions of the iris,

ii) extract the phase component features from the subregions,

iii) perform band limited phase only correlation (BLPOC) to recognize the subject,

iv) perform BLPOC with the extracted phase components of the subregions in hierarchical and parallel fashion.

The proposed methods show promising results for eyelash noise detection, accurate iris boundary extraction and ideal iris subregion extraction. This algorithm locates the iris region using caney edge detection technique and extracts the exact subregions, thereby neglecting the eye lash noises and specular reflection content. Finally, proposes an ideal iris model for accurate iris recognition. The developed method overcomes the limitations encountered in other iris normalization and eyelash detection techniques. The time taken for this feature extraction is minimal when compared to the other competent techniques. The evaluation showed that this algorithm improves the error rates in ROC curves. In addition, the EER % metric is calculated for both hierarchical and parallel phase based matching
methods in order to measure the recognition rate distributions. It is seen that a higher recognition rate is obtained for parallel PBM when compared with hierarchical PBM algorithm.

It is seen that a higher decidability measure is obtained for the proposed algorithms which implies that the iris recognition system implementing the phase based matching tend to have a better intra and inter-class distribution separation. This will result in lower false accept rate and false reject rate since it is easier to select the decision threshold that provides a good genuine impostor distribution separation. The match score using the enhanced technique is better within the entire comparison range since it uses the most of the iris region in the pattern matching process. Finally, this work describes two approaches to be used in two different environment of databases. And it is concluded with a key findings that hierarchical phase based matching is good a option for huge iris databases and the parallel phase based matching is good for small and medium databases.

8.2 FUTURE SCOPE

Based on the results of this thesis, there are several promising avenues of research that are likely to yield useful results.

- Sophisticated methods can be developed to enhance circular detection by accurately locating the iris and pupil boundaries even in a non cooperative access control system in the least amount of time by minimizing the identification error rates, since it is difficult to capture high-quality iris images with minimal user cooperation.

- It will be also interesting to study the biometric information theory in a way to analyze the information content with progressive image segmentation. It can give
further insight into how the segmentation affects the biometric entropy for recognition.

- The technique can be implemented for Iris images using contact lenses and iris images with multi scale and orientation.
- The techniques can be implemented for any multi modal biometric system.
- The techniques can also be implemented for any other fingerprint/face recognition systems for better time complexity.