ABSTRACT

Biometric refers to the process of identifying every individual based on his/her unique features in terms of behavioural and physiological characteristics. Behavioural characteristics mainly include signature, gait, and voice recognition whereas physiological characteristics include face, iris, ear, retina, hand, and fingerprint recognition respectively. Out of these various biometric traits, iris recognition is considered to be the most reliable and robust recognition methods for verifying and identifying the exact individual.

Various process in biometric iris recognition includes, eye image acquisition, image pre-processing, image segmentation, normalization, feature extraction, classification, and matching. Many state-of-the-art algorithms has been developed for iris recognition in past two decades. On the other hand, it is evident from the literature that only few hybrid algorithms are focused for recognizing the exact individuals. Hence, this thesis proposes new hybrid iris recognition methods for recognizing the individual more accurately under unconstrained environments that refer to occlusion due to upper and lower eyelid, specular reflections, eyelashes etc.,

The goal of this research is to propose an efficient iris recognition algorithm for recognizing the individual with high performance rate and accuracy. In this work, ten different methodologies namely DFT with SVM and KSVM algorithm (F-SVM and F-KSVM), Bernstein Polynomial with SVM and KSVM algorithm (B-SVM and B-KSVM), Hybrid DFT and Bernstein Polynomials with SVM and KSVM algorithm (FB-SVM and FB-KSVM), Hybrid DFT and Zernike moments with SVM and KSVM algorithm (FZ-SVM and FZ-KSVM), Hybrid DFT, Bernstein Polynomials and Zernike Moments with SVM and KSVM algorithms(FBZ-SVM and FBZ-KSVM)

have been proposed for recognizing the iris and are investigated using UBIRIS database.

Initially, Singular Value Decomposition is used for removing the occlusions from the acquired input image. Once the noise present in the iris image is eliminated, Canny Edge Detection and Circular Hough Transform are used for segmenting the iris image from the pre-processed image.

The proposed methodologies help in extracting the features from the segmented iris image which are further classified using machine learning algorithms such as Support Vector Machine and K-Means Support Vector Machine. The performance results are compared in terms of Accuracy, False Recognition Rate, False Acceptance Rate, and Equal Error Rate. The Experiment results show that the proposed algorithm provides better performance in terms of accuracy and recognition rates.