ABSTRACT

The human authorization plays an important role in the security. The human security is achieved by using biometric systems. The biometric systems are used in national identification cards, passport, Automated Teller Machine (ATM), employee authorization, forensic applications, highly securable authorization, driving license, transport reservation systems, internet banking transaction, confidential data or message transfer and network security. The aadhaar is the ongoing government project work in India which collects the biometric information of the people.

The structure of the human eye is not uniform for all. The left and right eye is different in a human. The twins are having the different eye structure. Therefore iris biometrics provides the uniqueness as compared with the other biometrics. The proposed research work is based on the iris biometrics. The iris is the part of the human eye. The iris is located in the front portion of the eye. The standard iris data bases are available for testing the iris recognition algorithms and the UBIRIS V-2 is used in the proposed research work.

The localization process of the proposed work is used to detect the iris boundary in the eye. The pupil boundary is located inside the iris which was detected using the various processes such as normalization, median filter, morphological operations, binary dilation and labelling. The iris boundary is detected using the reference of pupil boundary, edge detection and the
Multiple Left Right Point algorithm. The segmentation process is applied to separate the iris from the eye by excluding the eye lids and lashes. The enhancement process is used to convert the circular iris region into rectangular region and also foreground the hidden pixel using the histogram equalization process.

The proposed method used the 2D complex dual tree wavelet transform to extract the iris horizontal, vertical and diagonal frequency features. The more valid information was available in the vertical frequency signal which was taken as the proposed feature. The Multilinear Principle Component Analysis technique was used to reduce the dimensionality of the feature matrix.

The authorization stage of the proposed work used the Feed Forward Back Propagation Neural Network which is trained by Levenberg-Marquardt algorithm. It gives out the authorization by comparing the trained and test feature. The proposed method achieved the accuracy of 98.8%, False Acceptance Ratio of 0.4% and the False Rejection Ratio of 0.6%. The neural network comparison process was implemented in the Xilinx spartan-3E Field Programmable Gate Array which occupies the very low resources.