

# PCA, DCT and DWT based Face Recognition System using Random Forest Classifier

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*Abstract* – Face recognition plays an important role in biometrics base personal identification. The need for reliable recognition and identification of interacting users is obvious. The biometrics recognition technique acts as an efficient method and wide applications in the area of information retrieval, automatic banking, and control of access to security areas and so on. The proposed method is based on Principal Component Analysis (PCA) of image in DCT domain with a combination of details of DWT.

This approach reduces the storage requirement and computation time while preserving the data. The proposed scheme exploits feature extraction capabilities of the Discrete Wavelet Transform Decomposition and invokes certain normalization techniques that increase its robustness to variations in facial geometry and illumination. Traditionally, to represent the human face, PCA is performed on the whole facial image. Random Forest Classifier is used to classify the features and the similarity measure is done by Euclidian Distance. Experimental results show that the proposed method is effective and possesses several desirable properties when it compared with many existing algorithm. The approach PCA-DCT-hybrid DWT is evaluated on MATLAB using ORL face database. Compared to previous methods the proposed method improves feature extraction and retrieval rate.

*Keywords* – DCT, DWT, Euclidian Distance, ORL Face Database, PCA and Random Forest Classifier.