



A Hybrid Study and Development in Biometric system for Electronic Voting with influence in machine learning techniques

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Abstract: A novel hybrid design based electronic voting system is proposed, implemented and analyzed. The proposed system uses two voter verification techniques to give better results in comparison to single identification based systems. Finger print and facial recognition based methods are used for voter identification. Cross verification of a voter during an election process provides better accuracy than single parameter identification method. The facial recognition system uses Viola-Jones algorithm along with rectangular Haar feature selection method for detection and extraction of features to develop a biometric template and for feature extraction during the voting process. Cascaded machine learning based classifiers are used for comparing the features for identity verification using GPCA (Generalized Principle Component Analysis) and K-NN (K-Nearest Neighbor). It is accomplished through comparing the Eigen-vectors of the extracted features with the biometric template pre-stored in the election regulatory body database. The results of the proposed system show that the proposed cascaded design based system performs better than the systems using other classifiers or separate schemes i.e. facial or finger print based schemes. The proposed system will be highly useful for real time applications due to the reason that it has 91% accuracy under nominal light in terms of facial recognition.