

# **Investigation Of Facial Artifacts On Face Biometrics Using Eigenface Based Single And Multiple Neural Networks**

## **Abstract**

Biometrics has been an important issue pertaining to security in the last few decades. Departments or agencies entrusted with national security are increasingly installing surveillance cameras in strategic or critical areas to monitor the identities of the general public. Upon locating suspicious characters in the video feed, they are compared with existing databases to find a match. These databases are generally compiled from the National Registration Department (NRD), Immigration, intelligence agencies, etc. Unfortunately, as mentioned in most reports of tragic events, suspicious characters do not resemble anything like what has been stored in the databases. There is a high chance that the face biometric identification software will miss these culprits. In this paper we propose to investigate the effects of facial artifacts on the recognition rate of eigenface based neural networks. It has been found that eigenfaces coupled with Euclidean distance can be successfully used to recognize the human face in almost real-time. However, facial artifacts can cause the features that characterize a face to be distorted. Hence, it is desirable to identify problematic facial artifacts that can cause false identification or no identification. The main focus of this paper is the investigation of common facial artifacts on the performance of recognition and the proposition of modification to existing databases to improve the positive rate of identification. A professional graphic artist was used to modify the images used in the experiments. We use a single and multiple eigenface based neural network as the classifier in our experiments.

## **Subject Keywords**

Eigenfaces

Face biometrics

Face recognition

Facial artifacts