

LOCAL ADAPTIVE HISTOGRAM MATCHING FOR ILLUMINATION INVARIANT FACE RECOGNITION SYSTEM

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Abstract

The majority of face recognition algorithms appear to be sensitive to variation in illumination. Bad illumination is the most challenging problem that has to be considered while developing a robust face recognition system. This is a problem that has been researched since a decade. Change of Illumination results in significant performance drop. For some algorithms the effect of change in illumination is severe and recognition rate degrades significantly. Among them one of the algorithm is Principal Component Analysis (PCA) also known as Eigenface method, which is Often used in human face recognition systems.

For a slight change in lightning conditions between a query face and to that of a face image in the database, the performance of PCA degrades heavily. To overcome this problem in this paper we propose an image preprocessing technique called Local Adaptive Histogram Matching and Equalization (LAHMAE). This method is based on utilizing the data collected from the histogram of a part of an image that is in good illuminating conditions and from this data we process the remaining parts of the image to obtain a stable and uniformly illuminated image of good contrast Extensive experiments show the proposed preprocessing technique achieved exceptional increase in the recognition rate of PCA in varying illumination environments