Face Recognition using Maximum Variance and SVD of Order Statistics with only Three States of Hidden Markov Model

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Abstract

This paper presents a fast face recognition (FR) method using only three states of Hidden Markov Model (HMM), where the number of states is a major effective factor in computational complexity. Most of the researchers believe that each state represents one facial region, so they used five states or more according to the number of facial regions. In this work, a different idea has been proven, where the number of states is independent of the number of facial regions. The image is resized to 56x56, and order-statistic filters are used to improve the preprocessing operations and thereby reducing the influence of the illumination and noise. Up to three coefficients of Singular Value Decomposition (SVD) are utilized to describe overlapped blocks of size 5x56. Experimental results show that the proposed work manages to achieve 100% recognition rate on ORL face database using the maximum variance and two coefficients of SVD and can, therefore, be considered as the fastest face recognition type.

References
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Index Terms

Computer Science Information Sciences

Keywords

Face recognition, Hidden Markov Model, Order Statistic Filter, Number of states of HMM, Singular Value Decomposition.