

Extraction and comparison of local and global features for automatic recognition of face images

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Research on face recognition has always received attention due to its intrinsic cognitive scope and potential forensic applicability, including, for instance, the serious issue of missing kids and the problem of recognizing them based on their past biometric facial features. In the beginning, owing to technological limitations, works in this area have used techniques based on geometric features. However, with the increasing computational power, the use of holistic information has become more popular. Consequently, new studies have emerged with the intention to comparing the performance of the proposed techniques and the experimental results favored the implementation of holistic models. However, more recent studies have highlighted that both approaches, local and global, are useful and dependent on the application context. This work implements a comparison between the techniques Local Binary Pattern (LBP) and Principal Components Analysis (PCA) in order to understand and enhance particular characteristics of each method in the process of automatic recognition of face images. Our results have showed a good performance of the LBP in specific situations where the training set is composed of individuals in frontal pose with neutral facial expression only. However, using a training set with distinct poses and facial expressions, common in missing children cases, the PCA is more efficient. These results emphasize some previous conclusions available in the literature based on the use of local or global approaches, but have also provided a detailed analysis about the advantages and disadvantages of each method when using pre-processed face images. Supported by FAPESP/LIM-40-HC-FMUSP.

Biography

Vagner do Amaral is Research Assistant at the Department of Electrical Engineering of FEI and at Department of Forensic Medicine, Faculty of Medicine of University of Sao Paulo, he is also a PhD student in Signal Processing. In 2006, he received his Information Technology degree from Termomecanica Technology College and after working for six years in industry, as a system analyst, he obtained the M.Sc. degree in Artificial Intelligence from FEI, in 2011.

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