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Approximately Symmetrical Face Images for Image Preprocessing in Face Recognition and Sparse Representation based classification

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Abstract

Though most of faces are axis-symmetrical objects, few real-world face images are axis-symmetrical images. In the past years, there are many studies on face recognition, but only little attention is paid to this issue and few studies to explore and exploit the axis-symmetrical property of faces for face recognition are conducted. In this paper, we take the axis-symmetrical nature of faces into consideration and design a framework to produce approximately axis-symmetrical virtual dictionary for enhancing the accuracy of face recognition. It is noteworthy that the novel algorithm to produce axis-symmetrically virtual face images is mathematically very tractable and quite easy to implement. Extensive experimental results demonstrate the superiority in face recognition of the virtual face images obtained using our method to the original face images. Moreover, experimental results on different databases also show that the proposed method can achieve satisfactory classification accuracy in comparison with state-of-the-art image preprocessing algorithms. The matlab code of the proposed method will be available at <http://www.yongxu.org/lunwen.html>.

Keywords: approximately symmetrical face, virtual sample, face image

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