

A HYBRID ALGORITHM FOR FRONTAL FACE DETECTION IN COLOUR IMAGES

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This paper presents a technique for automatically detecting human faces for frontal, color images. Automatic face detection, with the purpose of localizing and extracting the face region from the background, is a complex problem in image processing because it has lots of variations of image appearance, such as pose variation (front, non-front), occlusion, image orientation, illuminating condition and facial expression.

Several methods are available to solve this problem: template matching, feature detection, Fisher Linear Discriminate and Neural Networks. This paper examines and compares two different face detection techniques namely, template based matching and feature based modeling. The weaknesses of each method can be demolished by combining these two methods.

The proposed system is based on a hybrid algorithm which combines two techniques namely Template matching and Feature detection. The first approach uses the average face for each class as a generic template and classifies the individual faces according to the best match of each template.

The second strategy uses the feature extraction stage and classifies the individual faces. In this approach, various types of facial features are detected and, faces are declared using these features on the human face model. The advantage of this method is that they are very fast. However, no method seems able to resolve the problem when background objects also have skin color, especially when they are merged with the face region, but this does. Also, these methods are very sensitive to varying lighting conditions.

Both these methods first detect regions, which are likely to contain human skin in the color image, and then extract information from these regions, which might indicate the location of a face in the image. The skin detection is performed using a skin filter, which relies on color and texture information. Experimental results demonstrate that the proposed approach has an overall improvement around 25% when compared to template matching alone and thus, it can efficiently detect human faces and satisfactorily deal with the problems caused by using only one of the algorithms; template matching or feature detection.