

Edge detection for facial emotion identification

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Identification of emotions have attracted a lot of interest in many applications, especially in the field of medicine, human-computer interaction and gaming. This paper proposes a method of using both the geometric structure information of faces and the image vector obtained by concatenating each row of pixel value of images to form the emotion classifier. Distance based parameters were extracted from each images as geometric information. Parameters such as the length between the eyes, width of the eye, length of the eye, mouth width, and mouth length were selected as features. These parameters were combined to form a geometric descriptor vector for each given image. Image vector was incorporated in the classifier in order to preserve the texture deformations during facial expressions such as appearance of cheek folds during smile. Both geometric descriptor and image vector were used to classify emotions anger, surprise, sad, neutral and smile. The results showed that the emotions surprise, smile and sad were identified correctly whereas anger and neutral were misclassified. Therefore to classify these two emotions correctly the usage of edge detected images was introduced. Edge detection significantly reduces the large amount of data and filters out the unwanted information while preserving the important structural properties. The only major difference between the two emotions anger and neutral are the length between the two eyebrows and deformations near eyes and eyebrows. These differences are captured by the edge detected images. There are a number of edge detection operators such as canny, sobel, prewitt and Robert. Although canny edge operator performs better under noisy situations compared to other edge operators, since our target was to use the edge detection to resolve the ambiguity between anger and neutral, the basic sobel edge operator is used to obtain edge detected images. The results showed that for edge detected images anger was classified with a high detection rate. Hence, by using the geometric descriptor and image vector the emotions surprise, sad and smile were classified, and using edge detected images anger and neutral were classified correctly.