

Emotion Recognition with Occlusions Based on Facial Expression Reconstruction and Weber Local Descriptor

Authors : Jadisha Cornejo, Helio Pedrini

Abstract : Recognition of emotions based on facial expressions has received increasing attention from the scientific community over the last years. Several fields of applications can benefit from facial emotion recognition, such as behavior prediction, interpersonal relations, human-computer interactions, recommendation systems. In this work, we develop and analyze an emotion recognition framework based on facial expressions robust to occlusions through the Weber Local Descriptor (WLD). Initially, the occluded facial expressions are reconstructed following an extension approach of Robust Principal Component Analysis (RPCA). Then, WLD features are extracted from the facial expression representation, as well as Local Binary Patterns (LBP) and Histogram of Oriented Gradients (HOG). The feature vector space is reduced using Principal Component Analysis (PCA) and Linear Discriminant Analysis (LDA). Finally, K-Nearest Neighbor (K-NN) and Support Vector Machine (SVM) classifiers are used to recognize the expressions. Experimental results on three public datasets demonstrated that the WLD representation achieved competitive accuracy rates for occluded and non-occluded facial expressions compared to other approaches available in the literature.

Keywords : emotion recognition, facial expression, occlusion, fiducial landmarks

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