SMILE STAGES CLASSIFICATION BASED ON FEATURE EXTRACTION 2DPCA AND 2DLDA FOR AESTHETIC DENTISTRY

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ABSTRACT

In the field of aesthetic dentistry has done research for classifying patterns that include smile styles, smile stages and smile types. Among this is research that discusses the smile pattern classification using PCA, LDA and SVM. Nevertheless this research has not done the calculation of PSNR for image quality and patterns of knowing smile. Because of the importance of accuracy in performing classification of smile patterns to avoid differences in perception among dentists, plastic surgeons and patients, this research discusses features extraction to classify the smile stages by using the method 2DPCA and 2DLDA. 2DPCA method is an extension of the PCA method, which can project an image directly, ie its image covariance matrix can be constructed directly using original image matrices. While 2DLDA method is developed from LDA method, which is similar to 2DPCA smile 2D image matrix need not be transformed into a vector image but directly image scatter matrix can be constructed directly using original image matrices. For the classification process, use euclidean distance and SVM multikelas namely one against one and one against all.

Tests in this research using 90 smiling faces data which has been validated by dentist specializing in tooth conservation (30 stage I, 30 stage III and 30 stage IV). The test results obtained is the average accuracy of smile stages classification as follows : using 2DPCA + euclidean distance of 93.33%, 2DPCA + SVM one-against one of 91.11%, 2DPCA + SVM one-against all 94.44%, 2DLDA + euclidean distance of 94.44%, + SVM 2DLDA one against one of 95.56%, and 2DLDA + SVM one-against all at 96.67%.

Keywords : smile stages classification, 2DPCA, 2DLDA, PSNR, SVM multiclass