A combination of 2DLDA and LDA Approach for Pomegranate Fruit Grade Analysis with K-SVM

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Abstract— **This paper is about investigating new simulation techniques to address the problem of pomegranate fruit classification using non-destructive technique. In this paper, healthy/damaged fruit recognition is implemented. The approach uses two new feature extraction adaptive mathematical principles of investigation on two-dimensional linear discriminant analysis (2DLDA) and a combination of 2DLDA and linear discriminant analysis(LDA), which is 2DLDA-LDA. In order to classify the extracted features in both the methods, the support vector machine (SVM) with training of polynomial, radial basis function, multilayer perception classifiers, quadratic programming and liner classifier kernel functions are used. The two implemented proposed techniques were tested using cofilab pomegranates database comprising of healthy/damaged fruit images. The performance metric such as accuracy, reduced dimension, runtime and mean square error are evaluated to demonstrate the effectiveness of the method. The simulation results show that 2DLDA- LDA is manifold superior among the two new techniques.**

Keywords— ***non-destructive technique, feature extraction, linear discriminant analysis, kernel support vector machine***.