

Utilization of novel Non-linear Methods for Inline Defect Detection in manufacturing of TFT-LCD glass substrates

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The visual appearance of certain manufactured products such as TFT-LCD (thin film transistor – liquid crystal display) glass substrates is often one of the major quality attributes which has to be controlled or maintained. This work presents an industrial application of a new machine vision methodology to manufacturing of TFT-LCD glass substrates. Because of the feature space with high dimensionality will generally result in additional complexity of interactions among the features and increased degree of noise, we use feature reduction methods to combine the features. Decision making was performed in three stages: feature extraction by computation of wavelet co-occurrence signature, dimension reduction with principle component analysis (PCA) and classification by classification & regression tree (CART), support vector machine (SVM) and neural network optimized via gravitational search algorithm (GSA). The results show that utilization of optimized SVM approach with GSA algorithm in classification of TFT-LCD glass defects could be a suitable alternative.