

Boosting multi-feature visual texture classifiers for the authentication of Jackson Pollock's drip paintings

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Abstract: Early attempts at authentication Jackson Pollock's drip paintings based on computer image analysis were restricted to a single "fractal" or "multi-fractal" visual feature, and achieved classification nearly indistinguishable from chance. Irfan and Stork pointed out that such Pollock authentication is an instance of visual texture recognition, a large discipline that universally relies on multiple visual features, and showed that modest, but statistically significant improvement in recognition accuracy can be achieved through the use of multiple features. Our work here extends such multi-feature classification by training on more image data and images of higher resolution of both genuine Pollocks and fakes. We exploit methods for feature extraction, feature selection and classifier techniques commonly used in pattern recognition research including Support Vector Machines (SVM), decision trees (DT), and AdaBoost. We extract features from the fractality, multifractality, pink noise patterns, topological genus, and curvature properties of the images of candidate paintings, and address learning issues that have arisen due to the small number of examples. In our experiments, we found that the unmodified classifiers like Support Vector Machines or Decision Tree alone give low accuracies (60%), but that statistical boosting through AdaBoost leads to accuracies of nearly 75%. Thus, although our set of observations is very small, we conclude that boosting methods can improve the accuracy of multi-feature classification of Pollock's drip paintings..