

基于颜色分形的不同产地烟叶聚类分析 Hierarchical Cluster Analysis of Tobacco Leaves from Different Areas Based on Fractal Color

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关键词: 烟叶 系统聚类分析 颜色 分形 计盒维数

摘要: 对较高精度的烟叶数字图像进行背景去除和分割预处理, 计算烟叶颜色各分量(红色、绿色、蓝色、亮度)的计盒维数, 绘制各颜色分量的计盒维数变化曲线, 进行烟叶颜色系统聚类分析。结果发现不同产地烟叶的颜色各分量计盒维数变化曲线存在较明显差异; 采用颜色分形维数作为聚类参数得到了最好的分类结果。这表明颜色分形维数可以作为按颜色分类的特征指标, 能更准确地描述图像颜色的分形分布特征。 High definition digital images of tobacco leaves were obtained, which were made on removing the background and segmentation processing. All the components of tobacco leaf color, such as red, green, blue and luminance, were calculated, as new indexes quantitatively described the color distribution state of tobacco leaf surface. The box-counting dimension variation curve of every color component was plotted. A hierarchical cluster analysis was performed on tobacco leaf color with fractal dimension as parameter. The results showed that there was obvious difference in the box-counting dimension variation curve of every color component of tobacco leaves from different growing areas. Cluster analysis with fractal dimension as parameter was very well consistent with tobacco grade experts. These results indicated color fractal dimension, as characteristic index of color classification, could more accurately describe the fractal distributed features of image color.

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