

Speeding up multi-class texture classification by one-pass vocabulary design and decision tree

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Abstract

The bag-of-keypoints representation started to be used as a black box providing reliable and repeatable measurements from images for a wide range of applications such as visual object recognition and texture classification. This order less bag-of-keypoints approach has the advantage of simplicity, lack of global geometry, and state-of-the-art performance in recent texture classification tasks. In such a model, the construction of a visual vocabulary plays a crucial role that not only affects the classification performance but also the construction process is very time consuming which makes it hard to apply on large datasets. This paper presents a fast approach for texture classification that integrates existing ideas to relieve the excessive time involved both in constructing a visual vocabulary and classifying unknown images using a support vector machine based decision tree. We conduct a comparative evaluation on three benchmark texture datasets: UIUCTex, Brodatz, and CURET. Our approach achieves comparable performance to previously reported results in multi-class classification at a drastically reduced time.

Author keywords

Bag-of-keypoints; Decision tree; SIFT; Support Vector Machine; Texture classification; Visual vocabulary

Indexed keywords

Bag-of-keypoints; SIFT; Support vector; Texture classification; Visual vocabularies

Engineering controlled terms: Decision trees; Information systems; Object recognition; Plant extracts; Support vector machines; Textures

Engineering main heading: Classification (of information)