Fusion of global shape and local features using meta-classifier framework.

ABSTRACT

In computer vision, objects in an image can be described using many features such as shape, color, texture and local features. The number of dimensions for each type of feature has differing size. Basically, the underlying belief from a recognition point of view is that, the more features being used, the better the recognition performance. However, having more features does not necessarily correlate to better performance. The higher dimensional vectors resulting from fusion might contain irrelevant or noisy features that can degrade classifier performance. Repetitive and potentially useless information might be present which further escalates the 'curse of dimensionality' problem. Consequently, unwanted and irrelevant features are removed from the combination of features. Although this technique provides promising recognition performance, it is not efficient when it comes to computational time in model building. This study proposes meta- classifier framework to ensure all relevant features are not ignored, while maintaining minimal computational time. In this framework, individual classifiers are trained using the local and global shape features, respectively. Then, these classifiers results are combined as input to the meta- classifier. Experimental results have shown to be comparable, or superior to existing state-of-the-art works for object class recognition.

Keyword: Meta-classifier; Shape features; Local features; Fusion.