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Bag of Words Representation Based on Weighting Useful Visual Words

Authors : Fatma Abdedayem

Abstract : The most effective and efficient methods in image categorization are almost based on bag-of-words (BOW) which presents image by a histogram of occurrence of visual words. In this paper, we propose a novel extension to this method. Firstly, we extract features in multi-scales by applying a color local descriptor named opponent-SIFT. Secondly, in order to represent image we use Spatial Pyramid Representation (SPR) and an extension to the BOW method which based on weighting visual words. Typically, the visual words are weighted during histogram assignment by computing the ratio of their occurrences in the image to the occurrences in the background. Finally, according to classical BOW retrieval framework, only a few words of the vocabulary is useful for image representation. Therefore, we select the useful weighted visual words that respect the threshold value. Experimentally, the algorithm is tested by using different image classes of PASCAL VOC 2007 and is compared against the classical bag-of-visual-words algorithm.

Keywords : BOW, useful visual words, weighted visual words, bag of visual words
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