

Abstract

Parametric image classification methods are usually complex because they require intensive training. Therefore, non-parametric Nearest Neighbour (NN) classifiers are preferred in many cases. Naive Bayes Nearest Neighbour (NBNN) and its modified version, local NBNN, are recently proposed classifiers that present decent performance with reduced complexity. They compute image-to-class (I2C) distance instead of image-to-image (I2I) distance. As a result, local image features will not be quantised and the effectiveness of classifiers thereby stays in a relatively good level. In this thesis, NBNN and local NBNN are further improved. With the idea of fully taking advantage of contextual information, we use saliency detectors to classify local features of reference images into foreground and background. We base our I2C distance computation on foreground and background separately. The suggestions from these distances can make label estimation more reliable. Though the times of I2C distance computation have been increased for each query image, we accelerate our classification procedure based on the evidence that the performances of NBNN and local NBNN are hardly affected when enough anchor points, which are produced by clustering, are put into use to replace the large number of referring features in each class. On the basis of the novel works stated above, the proposed context-aware methods outperform NBNN or local NBNN in both accuracy and efficiency. The comparisons have been made on three databases: Pami-09, Caltech-5, and 15-Scene.

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