Project title: Improving Large-Scale Image Classification Using Co-training With Multiple Classifiers

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Project summary:

We explore the use of co-training to improve the performance of image classification in the setting where multiple classifiers are used and several types of features are available. Features are assigned to classifiers in an optimal manner using hierarchical clustering with a distance metric based on conditional mutual information. The effect of increasing the number of classifiers is then evaluated by co-training using the assigned feature sets. Experimental results indicate that the feature assignments chosen by the clustering approach afford superior co-training performance in comparison to other logical assignment choices. The results also indicate that increasing the number of classifiers beyond two leads to improved performance provided that the classifiers are sufficiently independent, and are reasonable well balanced in terms of labelling ability.

Additionally, we explore the effect that the initial training set selection has on co-training performance. We find that the quality of training images has a profound effect on performance and provide recommendations for how best to select these images.

Publications:
