
A study of observation scales based on Felzenswalb-Huttenlocher dissimilarity measure for hierarchical segmentation

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Abstract

Hierarchical image segmentation provides a region-oriented scale-space, i.e., a set of image segmentations at different detail levels in which the segmentations at finer levels are nested with respect to those at coarser levels. Guimarães et al. proposed a hierarchical graph based image segmentation (HGB) method based on the Felzenswalb-Huttenlocher dissimilarity. This HGB method computes, for each edge of a graph, the minimum scale in a hierarchy at which two regions linked by this edge should merge according to the dissimilarity. In order to generalize this method, we first propose an algorithm to compute the intervals which contain all the observation scales at which the associated regions should merge. Then, following the current trend in mathematical morphology to study criteria which are not increasing on a hierarchy, we present various strategies to select a significant observation scale in these intervals. We use the BSDS dataset to assess our observation scale selection methods. The experiments show that some of these strategies lead to better segmentation results than the ones obtained with the original HGB method.

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