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Minimum Barrier Superpixel Segmentation

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Abstract

Superpixel have become an essential processing unit in many computer vision systems, and superpixel segmentation of images is one of the most important step. In this paper, an efficient superpixel segmentation algorithm was proposed. We introduce a new compact-aware Minimum Barrier distance for Superpixel segmentation (MBS), and a propagation scheme for the cluster centers between adjacent levels on a hierarchical architecture. Experiments show that it **achieves state-of-the-art performance and can be configured with simple trade-off between performance and efficiency**. Furthermore, the compactness of segmented superpixel could be flexibly controlled continuously by only one parameter, **which could be easily integrated in other computer vision tasks**. The source code of MBS is available at <https://github.com/YinlinHu/MBS>.

Keywords: Superpixels, minimum barrier distance, clustering

1. Introduction

Superpixels, which was first introduced by Ren and Malik in 2003 [14], have become an essential tool to the vision community. It describes the oversegmentation of an image into atomic regions that align well with object boundaries. Many vision applications benefit from representing an image as a collection of atomic regions, such as image parsing [19], object localization

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