Region-based Deformable Net for automatic color image segmentation

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Abstract:

Abstract. This paper introduces a new color image segmentation framework that unifies contour deformation and region-based segmentation. Instead of deforming a single or multiple contours, typically used with classical deformable contour methods, the proposed framework deforms a single planar net that represents the contours of all the objects in the image. The net consists of a group of vertices connected by edges without crossing each other. The connected edges form polygons that represent the segmented regions boundaries. During the deformation process, the algorithm changes the location and the number of vertices as well as the number of polygons to enhance the segmentation fit. The deformation forces for each polygon are generated based upon the average color of the region and the color of the pixels surrounding it. The algorithm is completely autonomous and does not require any user interference, training or preknowledge about the image contents. The experimental results demonstrate the capability of the algorithm to segment color images from arbitrary sources within reasonable time. Furthermore, the compact mathematical representation of the resulting boundaries could be of value for further image analysis.

Keywords:

Deformable contours

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