Color image segmentation using distance functions based on aggregation of pixels colors

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Abstract

This paper considers image segmentation relied on aggregated distance function using either aggregation of only distance functions or distance functions which are also and fuzzy metrics. In image segmentation algorithms, distance functions compare either two pixels or pixel with segments, and may be used to make decision regarding belongingness of image pixels. Choice of suitable distance function within the segmentation criterion is based on information fusion process. Application of the appropriate aggregation function enables to adjust the segmentation criteria according to intuitively expected decision. Aggregation function is applied on distance functions representing the basic criteria relevant for segmentation. In this paper, the fuzzy c-means clustering algorithm is used for image segmentation and experimental verification of used methodology for such a distance function construction. The quality of the performed segmentation with proposed distance functions is compared with the segmentation quality obtained by using the standard Euclidean metric.

Keywords: Aggregation function, Aggregated metric, Fuzzy metric, Image segmentation