

PERCEPTUAL COLOR IMAGE SIMILARITY USING FUZZY METRICS

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In many applications of the computer vision field measuring the similarity between (color) images is of paramount importance. However, the commonly used pixelwise similarity measures such as Mean Absolute Error, Peak Signal to Noise Ratio, Mean Squared Error or Normalized Color Difference do not match well with perceptual similarity.

Recently, a method for gray-scale image similarity (so called Structural Similarity Index) was proposed [3]. This method correlates quite well with the perceptual similarity and it has been extended also to color images. The method we discuss in this talk follows a procedure inspired in this recent work as follows: the images are processed with sliding patches so that a number of small image portions are compared and the similarity between two images is obtained by averaging the similarities of all portions. In each pair of patches three different factors are compared separately and then combined: contrast, structure and luminance. The particular expressions for these three factors cannot be directly generalized from gray-scale images to color images, and therefore we propose our own expressions to measure them.

Our method for comparison of color images is based on fuzzy metrics [1] taking into account their advantages. Experimental results employing perceptual similarity observations show that our proposal performs accurately and it shows some advantages in performance for images with low correlation among some image channels [2].

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