

Image Coloring with Neighborhood Matching

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Abstract

We propose a method to add chromatic information to greyscale images. Given a greyscale image, we transfer the color information in the set of training grey-**RGB** samples to it.

We based on the assumption that patches from images with the same size are samples from a low dimensional manifold and the assumption that luminance and chromatic channels are different observations of the same manifold.

Thus the intensity representations of a patch and its neighborhood share similar structure with their chromatic components. Given a greyscale patch, its neighborhood in the training set is found, and the corresponding neighborhood of color patches are used to retrieve the chromatic information.

Considering the fact, a patch can have different meaning in different context. Thus a higher level of correspondence between images are established. We partition both the training and the input image, and compute the affinity between parts from the training images and the input image. The affinity between parts is defined as “if being put together, how difficult to separate them from each other in the meaning of spectrum segmentation of the neighborhood graph”.

Comparative experiments are done. And this framework can also be used for different applications as multi-modal image retrieval.