Color Histogram Specification

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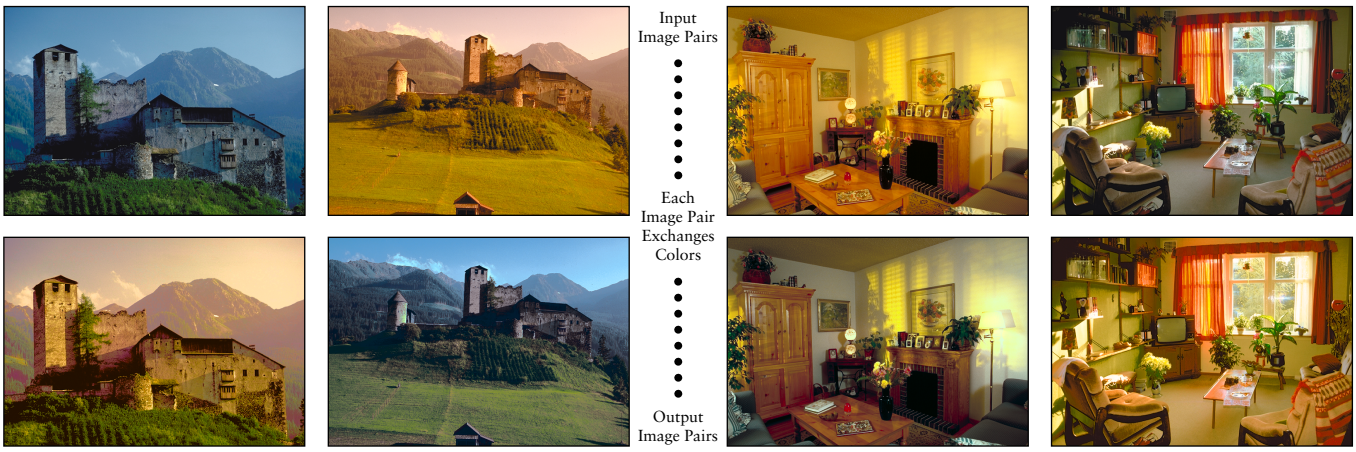
Color histogram specification is used to alter the overall color scheme of an image.

In order to transform the colors of a source image to match a target color distribution to any desired degree of accuracy, our technique applies histogram warping by monotonic splines to construct global color mapping functions. The target colors can be designated by a target image (a probability density function or color palette can also be used). The challenge is to apply the minimal color distortion necessary to the source image so that the resulting image acquires the dominant characteristics of the target image. Our method improves the reliability of the transformation by using a color space adapted to the source image and a color feature set adapted to the target image.

To reduce the risk of color distortion, the process operates on perceptually uniform color axes with statistically independent chromatic components. The coherence between the chromatic axes is eliminated by independent component analysis, so that each axis can be transformed independently. Each color transformation is defined by mapping a set of quantiles of the source distribution to the corresponding quantiles of the target distribution. The selection of these key colors governs the accuracy of the transformation. Evenly spaced quantiles only offer a reliable description of unimodal color distributions. To better reproduce the target color distribution, the transformation can be guided according to the dominant colors of the target color distribution as reflected in the modes of its histogram.

Transfer of Colors from One Image to Another



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