A Comprehensive Investigation of Color Models used in Image Processing

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Abstract

This paper is a study of different color models for color image processing. Color has been recognized as an important visual aspect for image and scene analysis. Research work in color image processing has focused on color image formation, color quantization, human visual perception, image segmentation, color-based object recognition, and image database retrieval. RGB color space is generally adopted by image acquisition device, while other kinds of color space are derived from RGB space by using either linear or nonlinear transformations. The choice of a color space is important for many computer image processing algorithms (e.g., feature detection, image classification, object recognition, and visual tracking). No color space can be considered as universal because color can be interpreted and modeled in different ways. With the large variety of available color spaces the inevitable question that arises is how to select the color model that produces the best result for a particular computer vision task. In this paper, the main aim is to survey the theory of different color spaces since the performance of an image analysis procedure is known to depend on the choice of the color space.
References


Index Terms

Computer Science

Image Processing

Keywords

RGB, HSV, CMYK, YCbCr, CIE; Space transformation.