Abstract

Humans have always seen the world in color. In the last three decades, there has been rapid and enormous transition from grayscale images to color ones. Well-known objective evaluation algorithms for measuring image quality include mean squared error (MSE), peak signal-to-noise ratio (PSNR), and human Visual System based one are structural similarity measures and edge
based similarity measures. One of the common and major limitations of these objective measures is that they evaluate the quality of grayscale images only and don’t make use of image color information. Since, Color is a powerful descriptor that often simplifies the object identification and extraction from a scene so color information also could influence human beings' judgments. So, in this paper new objective color image quality measure in spatial domain is proposed that overcomes the limitation of these existing methods significantly, is easy to calculate and applicable to various image processing applications. The proposed quality measure has been designed as a combination of four main factors: luminance similarity, structure correlation, edge similarity, and color similarity. This proposed index is mathematically defined and in it HVS model is explicitly employed. Experiments on various image distortion types indicate that this index performs significantly better than other traditional error summation methods and existing similarity measures.

Reference


**Index Terms**

Computer Science  
Image Processing

**Key words**

Human visual system (HVS)  
image quality assessment (IQA)  
mean structural similarity (MSSIM)  
mean squared error (MSE)

Visual Information Fidelity in Pixel Domain (VIFP)

peak signal to noise ratio (PSNR)