

博士论坛

## 利用HSV空间的双通道同态滤波真彩图像增强

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**摘要** 在RGB空间中分别对真彩图像的三个通道进行增强能够很好地压缩图像动态范围, 但往往会产生色彩偏离。文章提出先将真彩图像由RGB空间变换到HSV空间, 进行色度、饱和度和亮度分离, 然后对饱和度通道进行巴特沃斯同态滤波增强, 对亮度通道进行高斯同态滤波增强, 除此之外, 研究了同态滤波中高通滤波器截止频率如何确定的问题, 并解释了同态滤波器中的比例系数。实验证实, 增强后的真彩图像色彩基本无偏差, 图像动态范围压缩良好。

**关键词** [真彩图像](#) [色相、饱和度、明度 \(HSV\) 空间](#) [同态滤波](#) [巴特沃斯高通滤波器](#) [高斯高通滤波](#) [截止频率](#) [比例系数](#)

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## Using HSV space real-color image enhanced by homomorphic filter in two channels

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### Abstract

It provides good dynamic range compression in each red, green, and blue (RGB) channel of real-color image, but it fails in color rendition. In this paper, a real-color image is transformed from RGB space to HSV space at first. Then saturation channel is enhanced by Butterworth high-pass homomorphic filter and lightness channel is enhanced by Gaussian high-pass homomorphic filter. In addition, a new method how to fix on the cut-off frequency of high-pass filter in homomorphic enhancement is studied and the ratio coefficient of high-pass filter is explained. Experiments show the compression of real-color image dynamic range is obviously effective and it succeeds in color rendition.

**Key words** [real-color image](#) [Hue Sataration Value \(HSV\) space](#) [homomorphic filtering](#) [Butterworth high-pass filter](#) [Gaussian high-pass filter cut-off frequency](#) [ratio coefficient](#)

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