

Re: Luminance and RGB layers question

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- *From:* davem@xxxxxxxx (Dave Martindale)
 - *Date:* Wed, 14 Dec 2005 03:26:46 +0000 (UTC)
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Martin Leese <please@xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx> writes:

>Just to add a little bit to this excellent response.
>Some of the colour spaces you could use for this
>task are HSI, HSV, Lab. Delving into these might
>help you. The general procedure is to convert your
>RBG image to, say, HSI. Blend your graytone image
>into the Intensity (or Value or Luminance), then
>convert back to RGB.

Also, it's important to note that there are two different classes of "luminance plus colour" colour spaces, with different processing required if you change luminance.

Some colour spaces have colour components *that change in size along with luminance*. For example, look at the television YCbCr or YPbPr luminance plus colour difference representation. When the image gets brighter (e.g. by opening the camera lens aperture), Y increases but so do Cb and Cr. In a space like this, if you change the Y value you *also* have to multiply Cb and Cr by the ratio $\text{new_Y}/\text{old_Y}$ to keep the colour the same. (It's actually more complex than this in video, since zero brightness is not a zero pixel value).

Other colour spaces like $L^*a^*b^*$ have colour channels that are independent of luminance. With these, you don't need to adjust the colour data when changing luminance.

Dave

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- *References:*
 - ◆ ***Luminance and RGB layers question***
◇ *From:* Nicola Montecchiari
 - ◆ ***Re: Luminance and RGB layers question***
◇ *From:* Dave Martindale
 - ◆ ***Re: Luminance and RGB layers question***
◇ *From:* Martin Leese

Re: Luminance and RGB layers question

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