

## Re: interpolation for a color image?

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AE lover schrieb:

Hi all,

I am considering the case of bilinear interpolation for a color image (say RGB image), to apply a bilinear interpolation, will we apply the formular of bilinear interpolation, which we use for a gray image, for each channel R, G, and B, separately?

If so, why don't we take into account the interaction between three channels?

Interesting idea, and a longer answer.

It depends on what you think your image channels will be, and how to make use of their correlation. A typical way to do that is to first transform them to a different color space, for example YUV. The transformation between YUV (and related other spaces) is linear, and the bilinear interpolation filter is linear as well, but in a different dimension. This means that it actually makes *\*no\** difference at all whether you first transform to YUV, run there a bilinear filter, then transform back, or run the bilinear filter on RGB itself. The result will be the same. But *\*only\** because bilinear filtering is linear, and YUV to RGB is a linear transformation.

If you pick a nonlinear color space (say, CIElab) and/or a nonlinear filter (say, bicubic), things will be not so easy and the results will be different. Probably not much different, since the purpose of interpolation filters is to create pixels that are not very different from the surrounding.

Anyhow, if quality is of your concern, I would suggest to use a higher interpolation filter, bicubic is typically fine.

So long,  
Thomas

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