

Re: interpolation for a color image?

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AE lover <aelover11@xxxxxxxxxx> wrote in news:2a03e221-19de-4e85-81d1-0b0e3ee4d7e3@k37g2000hsf.googlegroups.com:

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 formula 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?

Thanks

Since resizing is a spatial transformation, it should be invariant to intensity levels (mono or RGB). Hence, it should not really matter if you do 3x (RGB) or 1x resizing (mono). On the other hand, interpolation errors on separate RGB channels may produce a new (combined) pixel value slightly different of the original one, leading to a color-distorted image (probably in the form of small color shifts at pixel-level scales).

My advice would be: (1) store the RGB ratios for each pixel, i.e., keep the original image, (2) convert the image into intensity matrix using a standard (linear) formula, (3) resize the intensity matrix, (4) convert the intensity matrix back to RGB using the values/ratios for each pixel from the original image. The single-channel approach cuts down your processing time almost to a factor of one-third (plus RGB conversions). Of course, you also need a mapping from the original to the new pixels (1 pixel → N pixels), so it is much simpler if you use integer multipliers in resizing (e.g. x2, x3, etc).

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Harris