Subject: Re: Image correction for human perception?
Posted by George N. White III on Sun, 01 Oct 2006 12:03:44 GMT
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On Sat, 30 Sep 2006, maye wrote:

> Hi!
> We have an interesting discussion going on here about the need of
> correcting intensities of remote sensing data in red, green and blue
> filters for the perception of the human eye to create a 'TRUE' color
> image.
> Basically, at the moment we tend to believe it's not necessary, because
> we have a good linear detection system (a CCD),
> so all we need to correct is the filter absorption (plus the usual CCD
> tralala of course).
> But after we have our calibrated images in the 3 colours and put this
> together to a colour image, why would we have to correct for the human
> eye spectral sensitivity, if looking at the image at the screen
> (provided my display system works ideal) will automatically involve the
> eye's sensitivity?

There is more to the process of viewing images -- you have to consider the limitations of the output device. Think about conventional photography where skilled photographers vary the exposure time for different areas of a print to bring out shadow detail that would otherwise be lost.

I work with "ocean colour" where we are interested in the subtle differences in the light leaving the water surface resulting from differences in the chlorophyll concentration (which can vary from 0.01 to 100 mg chl m^-3) among other factors. If you consider the earth as a whole, with cloud and land, the oceans are dark and you don't see many features. Yet it is possible to produce dramatic false-color images of chl concentration (see http://oceancolor.gsfc.nasa.gov/)

> Would the best way to display remote sensing data to the human eye not
> be, to try to show the exact same relative intensities like detected at
> the place of observation?
> What makes us doubt is the amount of publications one can find
> mentioning a "correction for human eye perception" and we fear, that
> they cannot ALL be wrong! :)
> So what do we miss? Is the problem maybe, that we only have data of 3
> filters and there's of course more? But the television works like that
> and can create quite realistic images, so it shouldn't be the problem?
> Thanks for your enlightenment!

Some applications correct a scene to what you would get with some "standard" illumination (e.g., local noon on a cloudy day), especially where multiple images are "stitched" together.

Start with http://www.cis.rit.edu/mcsl/iCAM/ and http://debevec.org/

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