Subject: A way to measure image blur / glow?
Posted by James[2] on Sat, 09 Jan 2010 02:13:37 GMT
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I'm working with a set of vascular images, taken on a cryo-microtome (see my post "An Introduction" from Nov. 17 for more info). The images are acquired by filling blood vessels of a biological sample with fluorescent polymer, and repeatedly taking photographs after slicing off a tiny layer of tissue. One major problem is that fluorescent material behind the current slice gives off enough light to show up in the image, resulting in a diffuse glow around the vessels of interest.

I've been trying out the next-image subtraction algorithm (http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2743343/), wherein the next slice behind the image of interest is blurred, attenuated, and subtracted from the current slice. The preliminary results look very good, but I'm looking for a way to automate the choice of optimal parameter choices for the Gaussian blur radius and the attenuation factor. So basically, I'm looking for a measure of how sharp, or glow-free, an image is. I've considered the fact that glow is not quite the same thing as blur. With glow, the features are still sharp, but there are haloes of not-as-bright pixels around them. With blur, there are no sharp edges.

My professor suggested measuring the magnitude of low frequencies in the Fourier Transform of the image, but that lead to the computer picking the image where nearly all of the data - glow or not - had been subtracted! So basically, I'm asking if anyone knows a good way to measure this without inadvertently subtracting useful data or creating false data.

Thanks,
James Preiss