Subject: Convolution Kernel
Posted by Gray on Thu, 02 Dec 2010 17:35:24 GMT
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Hi all,

Maybe my calculus is screwy, but this doesn't make sense to me.
Here's my issue:

I have two astronomical images (of stars). I've fit an average PSF as a Moffat profile for each of the two images. I want to find the optimal convolution kernel to match the two psfs, so I call on my old friend Mr. Fourier. If MA is the Moffat profile for image A and MB is the Moffat profile for image B (both 2d), and K is my optimal kernel, then I can do this:

MA ** K = MB --> ** is convolution in this scenario
F(MA**K) = F(MB) --> F() is the Fourier transform
F(MA) * F(K) = F(MB)
K = F^-1(F(MB)/F(MA))

With me so far? So I do this in IDL.
IDL> ma = moffat(params_a)
IDL> mb = moffat(params_b)
IDL> fma = fft(ma) & fmb = fft(mb)
IDL> k = fft(fma/fmb,/inverse)
IDL> mc = convol(ma,k)

What I get, however, is that MC is a 2d delta function. Why...? It happens with 2d Gaussians, as well. Thanks for your help!

--Gray