Subject: Re: Does CONVOL convolute
Posted by condor on Tue, 25 Feb 2003 00:50:57 GMT
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David Fanning <david@dfanning.com> wrote in message
news:<MPG.18c41ee199cd0d0b989afb@news.frii.com>...

> Setting CENTER=1 or /CENTER is the same as leaving the CENTER
> keyword off. (Don't ask!)

Oy, I'll ask anyways: Who's grand idea was that?

> If you want to perform convolution in
> the "strictly mathematical" sense, you must explicitly set CENTER=0.
> Is this what you were after:
>
> IDL> print,convol(tt,k, center=0)
> 0.000000 0.000000 0.000000 0.000000 0.000000
> 0.000000 0.000000 0.000000 0.000000 0.000000
> 0.000000 0.000000 1.00000 0.000000 0.000000
> 0.000000 0.000000 0.000000 0.000000 0.000000
> 0.000000 0.000000 0.000000 0.000000 0.000000

Huh? No, that isn't what I was after either.

Maybe I'm thinking something completely wrong here somewhere but if my
array is

1 0 0
0 0 0 ...
0 0 0
.
.

and my convolution kernel is

a b c
d e f
g h i

then I would expect the convolution to be

e f 0
h i 0 ...
0 0 0
.
.

At least for a symmetric kernel (I'd have to think about an unsymmetric one). I expect that because the fourier transform of a delta function is a constant (one) which is thus the multiplicative neutral element. And the fourier transform of a convolution of functions is the multiplication of the transforms of the functions themselves.

The longer I stare at the help, the more confused I get trying to figure out whether the [0,0] element of the result should be zero, as it seems to have a condition attached that reads (at least on my screen with the font the help uses) "if t >= 1-1 and u >= 1-1" . And I really don't think either of these "ones" could be 'lower-case ell' even though they use an 'ell' in the sum but without apparent motivation (or at least they don't seem to say what 'ell' *is*).

/edge_truncate goes in the vague direction

/edge_truncate,center=0 gives me something I don't understand at all

/edge_wrap does what it sounds like (which is not what I would consider useful
for most mathematical applications)

/edge_wrap,center=0 comes closest to what I would have expected

This is all rather mysterious to me - is the term "convolution" used differently in engineering than in math? Clearly I have to think about this some more ...
