Subject: Re: CONVOL : no subscripting with POLYFILLV?
Posted by Alex Schuster on Fri, 22 Jan 1999 08:00:00 GMT
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Tom Wassenaar wrote:

> I'd like to use polygon vertices directly to determine the image subset
> to convolve, but is it right that CONVOL only operates on simple square
> subscripts ?

It operates on square ARRAYS.

> a simple example :
> ENVI> a = findgen(10, 20)
> ENVI> kernel = fltarr(3, 3) + 1
> ENVI> b = convol(a[2:8, 4:15], kernel, total(kernel))
> ; this works fine !
> ENVI> x = POLYFILLV([2,2,8,8], [4,15,15,4], 10, 20)
> ENVI> b = convol(a[x], kernel, total(kernel))
> % CONVOL: Kernel's dimensions are incompatible with operand's.
>
> WHY ?

Because a[2:8,4:15] is a 2d array, where a[x] gives you a 1d
array/vector.

What exactly do you expect CONVOL to do with the pixels at the border of
the polygon?

You can do it like that:

```
c = a * 0.0
c[x] = a[x]
b = convol( c, kernel, total( kernel ) )
```

This gives low values for the pixels near the edges, and even for pixels
outside the polygon. The latter can be correted by

```
d = a * 0.0
d[x] = 1.0 ; create a mask
b = b * d
```

Still, the pixels near the border are under-evaluated, so another
correction helps:

```
e = convol( d, kernel, total( kernel ) )
f = d
f[x] = b[x] / e[x]
```

More information on this topic can be found in this paper from Joe Maisog:
An efficient method for correcting the edge artifact due to smoothing, Human Brain Mapping, 6:128-136 (1998; co-author J. Chmielowska).

Alex

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