Subject: Convolution
Posted by Kay Bente on Tue, 11 Sep 2001 12:22:18 GMT
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Hi

I have to convolute a 256x256x128 Floating Point array with a 3D Gaussian Kernel of ~ 30x30x30, this lasts round about 45Minutes. So my question is, if there is any way how i can speed this up. I tried to separate this in

correct (cause the procedure hangs up after a few loops)

I know that the Convolution of two functions is a Multiplication in Fourier Space, but how can I do this with discrete arrays, do I have to enlarge my kernel to the size of the array i want to smooth? If so, the creation of the kernel with the dimensions of my array nearly lasts as long as the normal convolution :-(

So i would be very happy about any hints!!

This is how I tried it

```
FUNCTION Gauss3D, mat, n, s
;n = Size Of Array
;s = Sigma

;Gauss Kernel is completely circularly symmetric operator
;=> Convol in each dimension with a 1D Kernel

;Create Kernel
a = DindGen(n)-(n/2)
print,a
kernel = Exp(-(Temporary(a))^2/(2.*s^2))/(Sqrt(2.*!PI)*s)

tstart=SysTime(1)
s=Size(mat,/Dimensions)

mat2=FltArr(s(0),s(1),s(2))


;Convol in X,Y
FOR i=0, s(2) DO BEGIN
 buffer=mat(*,*,i)
 buffer1=Convol(buffer,kernel,Total(kernel))
 buffer1=Convol(buffer1,Rotate(kernel,1),Total(kernel))
 mat2(*,*,i)=Temporary(buffer1)
ENDFOR

;Convol in Z
```

```
FOR i=0, s(1) DO BEGIN
 buffer=mat2(*,i,*)
 buffer1=Convol(buffer,kernel,Total(kernel))
 mat2(*,i,*)=Temporary(buffer)
ENDFOR
Return, mat2
END
```

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