Subject: Cholesky factorisation
Posted by Peter Scarth on Tue, 22 Feb 2000 08:00:00 GMT
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Howdy all,
I'm trying to determine if a symmetric matrix is positive-definite. If this sounds like gobbdlygook you might like to stop reading here. If the idl2matlab translate-o-matic existed, it would probably need to know about this to translate the handy \ (mldivide) operator. There a number of tests for positive-definiteness and the one I'm looking at is to attempt cholesky factorisation of the matrix. IDL's CHOLDC procedure halts and returns CHOLDC: choldc failed (note that matlab can return a value to flag a failure in the decomposition).
The metho that I an using to get the decomposition looks something like this:

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pro choldc2,a,p
sa=size(a)
nd=sa[0] & m=sa[1] & n=sa[2]

; Some initial tests.....
; .....

p=fltarr(n)
for i=0,n-1 do begin
 for j=i,n-1 do begin
 sum=a(j,i)
 if i gt 0 then sum=sum-total(a(0:i-1,i)*a(0:i-1,j))
 if (i eq j) then begin
  if (sum le 0) then begin
  p=-1
  return
  endif else p(i)=sqrt(sum)
 endif else a(i,j)=sum/p(i)
 endfor
endfor
return
end
----------------------
```

it works ok, returns -1 in p if the method fails but only runs at 1/10 the speed of the built in version.
Is it possible to vectorise this further, or has someone out there in cyberland found a more elegant solution to this problem already?

Thanks,

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