Subject: Re: Singular Value Decomposition in 3 Dimensions
Posted by Juggernaut on Wed, 03 Sep 2008 11:52:00 GMT
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On Sep 2, 12:33 pm, tomandwilltam...@gmail.com wrote:
> I am wondering how to do Singular Value Decomposition in 3 Dimensions
> in IDL. All of the canned routines seem to work only on 2D arrays.
>
> Specifically, I am trying to preform Principle Component Analysis on
> stacks of 2D images.
>
> For example, how can one preform an SVD on a 2048x2048xn array to get
> 2048x2048 principle components?
>
> Thanks much,
> -Will

If you want the principal components for the
3D array you can do something like this
sz = size(array, /dimensions)
newArray = fltarr(sz[2], sz[1]*sz[0])
FOR i=0, sz[2]-1 DO BEGIN
  newArray[i,*] = transpose(reform(array[*,*,i], sz[0]*sz[1]))
ENDFOR
result = pcomp(newArray, eigenvalues=evals, /standardize)

pcomp() is IDLs built in for doing PCA and result will be
an array of I believe the same dimensions of newArray which to
get back into viewing form you could just reform it back like

tv, reform(result[0,*],sz[0],sz[1])

There may be better ways of doing it but I may as well give
you a point to jump off of