Subject: Re: singular value decompostion
Posted by H T Onishi on Fri, 02 Jul 1999 07:00:00 GMT
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> Thanks, that clarifies some points. You were correct, I copied down a .46
> rather than a -.46.
>
> I will run through your exercise to make sure I understand correctly.
>
> Do you have any experience with Principal component analysis and how that
can
> be done with SVD?
>
> Thanks again,
>
> Dave
>

I am not an expert in the SVD algorithm. The note by Fogel should be heeded and you may want to search the appropriate newsgroup for more info. I believe that the SVD algorithm implemented in IDL was taken from Numerical Recipes and there seems to be a lot of controversy over those routines. You may want to read http://math.jpl.nasa.gov/nr/nr-alt.html for more info. I know that I had to "tweak" an early version of the SVD routine from Numerical Recipes to get it to work properly -- problems with underflow.

Regarding Principal Component Analysis, I believe that SVD is the key algorithm used to extract the PC's. I know that it has been used with some success to remove background clutter from imagery that contains moving targets. Again I am not an expert here (in fact not even a novice) but from what I understand a set of images of the same scene -- possibly multi-spectral -- is combined into a large matrix. Each image is turned into a vector and the set of vectors is combined into a large matrix. These vectors span a vector space and the PCs corresponding to the largest singular values represent clutter vectors that can then be subtracted from the original image. I think the PCs are in the V matrix, but there is a 50% chance that I'm wrong about that. That's about all I know. I'm sure there are many more applications. I suggest you do a search with AltaVista to see what you can find! Or you can be more conventional and do a literature search, which might be more fruitful.

Howard