
Subject: Re: Help with MNF in ENVI

Posted by [Peter Mason](#) on Wed, 21 Apr 2004 00:32:39 GMT

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Zhihong Pan wrote:

> Hi, All

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> First post here, need help for MNF transformation in ENVI program.

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> apply the existing MNF transformation to a few spectra but ENVI

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> MNF statistics file but not sure about the details. Any comments

> appreciated.

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> BTW, this might not be the correct forum for ENVI question. Any

> recommends of forums for ENVI program?

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> Thanks

It seems to be okay to post ENVI questions here. <cringes>

Anyway... I was also faced with this issue a few years ago. I did some

experiments and, IIRC, in an MNF stats file the forward transformation

matrix is saved in the spot where the *covariance* matrix is usually saved.

The MNF eigenvalues are saved in the eigenvalue spot. Not sure about the

eigenvectors spot - possibly the reverse transformation matrix.

It has been some time since I checked this and things might have changed,

but assuming they haven't, this is how you'd get the goodies to do your own

MNF transform:

```
envi_get_statistics, stats_file_name, cpos=cpos, mean=avg, cov=fmnf,  
eval=mnfeval
```

(You don't actually need MNFEVAL for the transform but it's handy for a plot.)

More detail:

The image mean (AVG) is always computed for all bands while the MNF stats

can be computed for a subset. CPOS is an index array showing which bands

were used. Last I checked, an ENVI stats file doesn't contain band

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Compare your full number of bands against N_ELEMENTS(AVG) and the size and

contents of your selected-bands index array against CPOS.

In order to do the transform you will have to extract the MNF's input

channel subset from AVG:

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AVG_SUB=AVG[CPOS]
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The transform for a spectrum SPEC then goes something like this:

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(SPEC-AVG_SUB) ## FMNF
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(# or ##? You ask too much of me :-)) FMNF or TRANSPOSE(FMNF)? Again,

you ask too much :-) A couple of experiments with an image and you'll be there.)

BTW, if you are thinking of transforming, say, resampled spectral-library spectra using MNF stats calculated for an image, remember that it'll only work if the spectra are of the same kind as what's in the image (e.g., both reflectance) and are scaled the same (e.g., both 0 to 10000). (This in addition to having the same #bands and wavelengths.)

HTH
Cheers
Peter Mason

Subject: Re: Help with MNF in ENVI
Posted by [Zhihong Pan](#) on Wed, 21 Apr 2004 01:08:25 GMT
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You are the man, Peter.

You got it all correct (it's ## if you want to know). I was messing with evec but no luck. Thanks again.

Pan

PS, just read your reply again. Found a minor bug, for AVG, it's only computed for the selected bands but stored in original order. So the non-selected bands have zero in the array.

On Wed, 21 Apr 2004, Peter Mason wrote:

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Subject: Re: Help with MNF in ENVI

Posted by [jnettle1](#) on Wed, 21 Apr 2004 15:55:00 GMT

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You were apparently looking for a way to programatically apply an MNF to a set of spectra, but just in case you're willing to do it by and missed it, ENVI has an "Apply forward MNF to spectra" routine that I believe will do just what you want. But I don't know if there's a "doit" procedure that goes along with it. I haven't played with these kinds of operations that much. Anyway, just thought I'd mention this, just in case :)

Jeff

Zhihong Pan <zpan@malibu.eecs.uci.edu> wrote in message news:<Pine.GSO.4.58.0404201803450.22467@malibu.eecs.uci.edu>...

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