Subject: Re: Algorithm for PCA transform in ENVI
Posted by Kenneth P. Bowman on Wed, 09 May 2012 15:01:54 GMT
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In article <0de35e20-3a9c-4593-8f06-ed3e6461fe60@p21g2000vby.googlegroups.com>,
eva.ivits-wasser@ext.jrc.ec.europa.eu wrote:

> Does anybody know what the algorithm for PCA transform in ENVI is?
> I've compared the eigenvectors and the spatial patterns of ENVI's PCA
> transform with IDL's eigenql, svdc and la_svd procedures. The first PC
> components are the same but from the second component on I have
> negative values where ENVI give positive values and vice versa.
> Accordingly, the first element in the diagonal of the eigenvector
> matrices has the same sign but the rest of the signs are just the
> oppostie comparing results from ENVI and IDL.
> Any clues?
> Thanks in advance,
> Eva

If you have a properly-constructed covariance matrix, the eigenvalues should all
be greater than or equal to zero. If you are getting negative eigenvalues you
are doing something wrong.

http://brunnur.vedur.is/pub/halldor/PICKUP/eof.pdf

Ken Bowman

Subject: Re: Algorithm for PCA transform in ENVI
Posted by ivitseva on Thu, 10 May 2012 09:17:40 GMT
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On May 9, 5:01 pm, "Kenneth P. Bowman" <k-bow...@null.edu> wrote:
> In article < 0de35e20-3a9c-4593-8f06-ed3e6461f...@p21g2000vby.googlegroup s.com >,
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Hi Ken,
Thanks.
It is the eigenvectors and not the eigenvalues I was talking about
(btw. the eigenvalues are all positive). And using the svdc function
you do not use the covariance matrix but the centered time series.
Anyway, the problem is that the signs in the spatial patterns (EOFs or
the modes) are the opposite of that what ENVI reports, which is
probably a question of rotation. However, I do not know what ENVI does
and thus I cannot decide what the problem is. That is why I've posted
the question.

Eva

Subject: Re: Algorithm for PCA transform in ENVI
Posted by lecacheux.alain on Thu, 10 May 2012 12:12:06 GMT
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On 10 mai, 11:17, ivitseva <eva.ivits-was...@jrc.ec.europa.eu> wrote:
> On May 9, 5:01 pm, "Kenneth P. Bowman" <k-bow...@null.edu> wrote:
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Eva,
SVD algorithm produces unique singular vectors, up to multiplication
by an unit phase factor (for the real case up to sign). That is the
same as saying that singular vector matrices must be unitary.
ENVI and IDL are not in contradiction. They are just doing different
arbitrary choices.
alain.

Subject: Re: Algorithm for PCA transform in ENVI
Posted by ivitseva on Thu, 10 May 2012 14:39:45 GMT
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On May 10, 2:12 pm, alx <lecacheux.al...@wanadoo.fr> wrote:
> On 10 mai, 11:17, ivitseva <eva.ivits-was...@jrc.ec.europa.eu> wrote:
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>
>
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> ENVI and IDL are not in contradiction. They are just doing different
> arbitrary choices.
> alain.

Hi Alain,

I understand when you are saying that ENVI and IDL are just doing
different arbitrary choices. However, if I look at the second EOF mode
I will have negative values in ENVI reporting, using precipitation

anomalies as input, drought whereas I'll have positive values in IDL's output reporting wetter than average conditions. Over the same pixels! I still do not understand how the outcomes can be so different, I mean COMPLETELY different up to the level of reporting a contradictory meteorological phenomena! Sorry for being difficult....
Cheers,
Eva
