Subject: Re: Principle Componets Analysis
Posted by David Fanning on Fri, 24 Aug 2007 15:46:49 GMT
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Yaswant Pradhan writes:

> Yes, both methods are essentially same except that the data in
> Method#1 are NOT standardised. You will get exactly same result if you
> do
> xmean = (x - Mean(x) / Stddev(x)
> ymean = (y - Mean(y) / STddev(y)

Well, not exactly. Did you run the example with this change?
I get something quite a bit different, although still "correct"
I think.

```
;********************************************************** ***
; Method according to the Lindsay Smith tutorial:
; http://tinyurl.com/3aaeb6

x = [2.5, 0.5, 2.2, 1.9, 3.1, 2.3, 2.0, 1.0, 1.5, 1.1]
y = [2.4, 0.7, 2.9, 2.2, 3.0, 2.7, 1.6, 1.1, 1.6, 0.9]

xmean = (x - Mean(x)) / STDDEV(x, /DOUBLE)
ymean = (y - Mean(y)) / STDDEV(y, /DOUBLE)
Window, XSIZE=600, YSIZE=800
!P.MULTI=[0,1,2]
Plot, xmean, ymean, PSYM=7

dataAdjust = Transpose([ [xmean], [ymean] ])
covArray = Correlate(dataAdjust, /COVARIANCE, /DOUBLE)
eigenvalues = EIGENQL(covArray, EIGENVECTORS=eigenvectors, /DOUBLE)

Print, 'EIGENVALUES: ', eigenvalues
Print, 'EIGENVECTORS: '
Print, eigenvectors

rowFeatureVector = eigenvectors[0,*] ; Take first principle component.
;rowFeatureVector = eigenvectors
finalData = Transpose(rowFeatureVector) ## Transpose(dataAdjust)
Plot, finaldata+Mean(x), finaldata+mean(y), PSYM=7
!P.MULTI=0



; Method using PCOMP in IDL library.
data = Transpose([[x],[y]])
r = PCOMP(data, /COVARIANCE, NVARIABLES=1, $
```

```
   EIGENVALUES=ev, /STANDARDIZE)
Print, 'IDL EIGENVALUES: ', ev


; Compare methods.
Window, 1
PLOT, r
OPLOT, finalData, LINESTYLE=2;, COLOR=FSC_Color('yellow')

Window, 2
PLOT, r + Mean(x), r + Mean(y), PSYM=2
OPLOT, finalData + Mean(x), finalData + Mean(y), $
   PSYM=7;, COLOR=FSC_Color('yellow')
END
 ;************************************************************ ***
```

The curves in Window 1 are worse than they were without
making the change you suggest.

Cheers,

David

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