Subject: Re: multi-dimensional SVDFIT
Posted by ingo on Wed, 04 Jul 2001 11:57:47 GMT
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> " " == R G S <rgs1967@hotmail.com> writes:
> Hello,
> the SVD solution to a least squares fit (Ax=b) to higher dimensions is
> trivial.
> Merely add on the other dimensions as columns of A, since there is no
> difference
> in principal between "x^2" and "xy", since to the SVD, the matrix A is
> merely a collection
> of numbers.

> Cheers,
> bob stockwell
> stocwkell at co-ra dot com

> For instance, here is a smallpiece of code that will compute a fit to
> f(x,y,z) = a0+a1*x+a2*y+a3*z+a4x*y+a5x*z+a6y*z+a7= x^2+a8y^2+a9z^2

> (i.e. 10 parameters second order term polynomial in 3D)

> ; Here zon = data(x,y,z)
> m = 10 ; number of terms in equation
> n = n_elements(zon) ; n = number of data points

> ; create matrix colum by colum
> a = dblarr(m,n)
> a(0,*) = 1
> a(1,*) = x
> a(2,*) = y
> a(3,*) = z
> a(4,*) = x*y
> a(5,*) = x*z
> a(6,*) = y*z
> a(7,*) = x^2
> a(8,*) = y^2
> a(9,*) = z^2

```
 > ; Decompose A:
 > tic = systime(1)
 > SVDC, A, W, U, V,/double
 > toc = systime(1)

 > ; Compute the solution and print the result:
 > result1 = SVSOL(U, W, V, zon,/double)
 > toc2 = systime(1)
 > print,result1
```

Hi Bob,
thanx for your response, but unfortunately it doesn't work with
SVDFIT.
The error message looks like 'SVDFIT: The input X must be a vector'
SVDFIT does also not accept X as a structur.
here my code:

```
;declaring x1,x2

x=fltarr(2,length)
x(0,*)=t
x(1,*)=aa_ind

;first guess
A=[1,1,1,1,1,1,1,1,1] ; m=N_ELEMENTS(A)
;ts == my data
result=svdfit(x,ts,A=A, MEASURE_ERRORS=0.05*ts, $
            FUNCTION_NAME='myfunct2',SIGMA=sigma,YFIT=YFIT)

window,0,retain=2
!P.MULTI=[0,1,2]
PLOT,YFIT
PLOT,ts

FUNCTION myfunct2,X,M

  RETURN,[[X(1,*)],$
        [SIN(2*!pi*X(0,*))/365.25],[COS(2*!pi*X(0,*))/365.25],$
        [SIN(2*!pi*X(0,*))/183.0], [COS(2*!pi*X(0,*))/183.0],$
        [1.0],[X(0,*)],[X(0,*)^2],[X(0,*)^3]]
END
```

It seems to me that i have to use svdc and svsol. (??)
thanx, ingo

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There was a young lady named Bright,
Whose speed was far faster than light;
She set out one day,
In a relative way,
And returned home at the previous night. Arthur Buller