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Subject: Surface fit or 3d interpolation

Posted by [paz](#) on Mon, 22 Nov 1993 18:29:13 GMT

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Does anyone have a routine for a surface fit or 3d interpolation?  
I'm trying to interpolate some pressure data from a wind tunnel test  
to correlate with my analytical model.

Thanks,  
Peter

paz@mickey.eng.gulfaero.com (This always works)  
paz@gulfaero.com (This sometimes works)  
paz@voyager.larc.nasa.gov (This works for the moment)  
> INTERNET:paz@mickey.eng.gulfaero.com (From compuserve)

"This is a UNIX system. I know this." - Jurassic Park

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Subject: Re: surface fit

Posted by [buteau](#) on Tue, 08 Nov 1994 16:12:19 GMT

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I don't understand what you mean by :

> One then is not fitting  $F(X,Y)$  but  $F(S)$ . All one needs to do then is to write  
> the definition of the function so that it can then determine  $X(S)$  and  $Y(S)$ . A  
> simple way to do this is through a common block.

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Subject: Re: surface fit

Posted by [thompson](#) on Wed, 09 Nov 1994 13:53:03 GMT

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buteau@bali.saclay.cea.fr (A.Buteau 62 17) writes:

> I don't understand what you mean by :

>> One then is not fitting  $F(X,Y)$  but  $F(S)$ . All one needs to do then is to  
>> write the definition of the function so that it can then determine  $X(S)$  and  
>>  $Y(S)$ . A simple way to do this is through a common block.

O.K., here's a simple example. Suppose that one wanted to fit a two-dimensional gaussian to a set of X-Y points, i.e.

$$F(X,Y) = A0 + A1*\exp(-r^2/(2*\sigma^2))$$

$$r^2 = (x-X0)^2 + (y-y0)^2$$

One would then write the function as follows:

```
FUNCTION GAUSS2, S, A, PDER
COMMON GAUSS2_COM, X_ARRAY, Y_ARRAY
X = X_ARRAY(S)
Y = Y_ARRAY(S)
R2 = (X - A(2))^2 + (Y - A(3))^2
F = A(0) + A1*EXP(-R2/(2.*A(4)^2))
PDER = ... ;Left as an exercise to the reader :)
RETURN, F
END
```

Your actual measurement points are a series of X,Y pairs. These are stored as X\_ARRAY, Y\_ARRAY in the GAUSS2\_COM common block. S is simply an index array running from 0 to one less than the number of points. If the measured values at these points are Z, then one can call CURVEFIT as follows

```
Result = CURVEFIT(S, Z, W, A, SIGMAA, FUNCTION='GAUSS2')
```

Bill Thompson

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