Subject: Re: Plane fit
Posted by Dick Jackson on Tue, 20 Apr 2004 15:55:19 GMT
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Hi Steve,

"Steve" <Steve.Morris@libero.it> wrote in message
news:606669c3.0404200355.71209718@posting.google.com...
> Hi!
> I was wondering if there is any function/routine to compute a 2
> dimensional fit (i.e. a surface) that fits a series of points spread
> in 3-dim space.
> Cheers,
> S.

This is what I use, based on Craig Markwardt's excellent MPFIT routines
(you'll need at least mpfit.pro and mpfit2dfun.pro from
http://cow.physics.wisc.edu/~craigm/idl/fitting.html):

```
;---------------------------------------

FUNCTION Plane2DFunction, x, y, parms, dParms
; parms define a plane: [c00, c01, c10] (1st-order polynomial in 2
vbles)
Return, parms[0] + parms[1]*x + parms[2]*y
END

;---------------------------------------

;;    Then, if data is a (3, n) array of xyz points...

fitParms = MPFIT2DFUN('Plane2DFunction', $
                data[0, *], data[1, *], data[2, *], $
                0D, $ ; Error measure, ignored with Weights...
                [Mean(data[2, *]), 0D, 0D], $ ; Estimate
                Weights=Replicate(1D, nPts), /Quiet)

;;    Then, for any x and y values...

fitZ = Plane2DFunction(x, y, fitParms)

;---------------------------------------
```

Hope this helps!

Cheers,
--
-Dick

Dick Jackson / dick@d-jackson.com
D-Jackson Software Consulting / http://www.d-jackson.com
Calgary, Alberta, Canada / +1-403-242-7398 / Fax: 241-7392

Subject: Re: Plane fit
Posted by MKatz843 on Fri, 23 Apr 2004 05:43:31 GMT
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> I was wondering if there is any function/routine to compute a 2
> dimensional fit (i.e. a surface) that fits a series of points spread
> in 3-dim space.

Here's what I use. My own home-cooked simple plane fit based on least squares. It couldn't be simpler. Well I suppose without all the keywords it could, but what fun is that?

```
; M. Katz 1/26/04
; IDL function to perform a least-squares fit a plane, based on
;   Ax + By + C = z
;
;   ABC = plane_fit(x, y, z, error=error)
;
function plane_fit, x, y, z, error=error, noerror=noerror,
noshow=noshow

  tx2 = total(x^2)
  ty2 = total(y^2)
  txy = total(x*y)
  tx = total(x)
  ty = total(y)
  N = n_elements(x)

  A = [[tx2, txy, tx], $
       [txy, ty2, ty], $
       [tx,  ty,  N ]]

  b = [total(z*x), total(z*y), total(z)]

  out = invert(a) # b

  if not keyword_set(noshow) then begin
    print, 'Plane Fit: Ax + By + C = z'
    print, 'A = ', out(0)
    print, 'B = ', out(1)
    print, 'C = ', out(2)
  endif
```

```
  if not keyword_set(noerror) then begin
    error = stdev(out(0)*x + out(1)*y + out(2) - z)
    if not keyword_set(noshow) $
      then print, 's = ', error
  endif

return, out ;--- [A,B,C]
end
```

Unless you set the noerror keyword, the program also calculates the RMS error and returns it as a scalar in the error keyword. The noshow keyword suppresses printing of the A,B,C values to the screen.

Subject: Re: Plane fit
Posted by Steve.Morris on Tue, 27 Apr 2004 21:18:01 GMT
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Hi!
Thanks both, the function plane_fit is really straightforward and work excellent!

I have tried to get more confident with the powerfull mpfit package, but I'm still stuck at the first step :(

Here is what I do (where x,y,z have the following format array[n] and I have no errors for my data ... gedankexperiment ;) !)

```
FitParms = MPFIT2DFUN('Plane2DFunction',$
                x ,y, z,$
                start_params=[0.D,0.D,0.D],$
                /WEIGHTS, /Quiet)
```

where the fitting function is defined as follows

```
FUNCTION Plane2DFunction, x, y, P
Return, P[0] + P[1]*x + P[2]*y
END
```

If I use the keyword Quiet, and query(help,FitParms) about FitParms, idl reply me
FITPARMS DOUBLE = NaN

If I drop the keyword Quiet, I have the following message
MPFIT2DFUN: ERROR: must pass parameters in P or PARINFO
and FitParms is still NaN ...

Where do I wrong? Probably I'm doing something really stupid
Thanks!Cheers,
S.