Subject: mpfit: multivariate fit
Posted by Dave[3] on Tue, 08 May 2007 04:19:09 GMT
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Hi all,

I'm trying to use MPFIT to numerically estimate a coordinate transformation matrix that relates two sensors. One set is uncalibrated, and the other has a known calibration. So, I have a set of observed vectors (xyz_obs) and a set of known vectors (xyz_known) and I'm trying to estimate (in a least squares sense) the transformation matrix T that relates them. Judiciously choosing the data in the fictional example below, I expect the transformation matrix to be 2 * identity(3,3).

When I execute the code below, I get:

```
IDL> .r foo
% Compiled module: TRANS.
% Compiled module: $MAIN$.
Iter      1   CHI-SQUARE =       1278958.0         DOF = 291
    P(0) =            1.00000
    P(1) =            0.00000
    P(2) =            0.00000
    P(3) =            0.00000
    P(4) =            1.00000
    P(5) =            0.00000
    P(6) =            0.00000
    P(7) =            0.00000
    P(8) =            1.00000
% MPFIT: Error detected while calling MPFIT_FDJAC2:
% MPFIT: Out of range subscript encountered: FJAC.
% MPFIT: Error condition detected. Returning to MAIN level.
```

Any ideas on what I'm doing wrong here?

Thanks!
Dave

%%%
% Contents of foo.pro
%%%

```
function trans, K, X=x, Y=y, err=err, forward=fw
  model = K ## x
  if keyword_set(fw) then return, model else return, (y-model)/err
end
```

```
; MAIN

; Attempt to estimate the transformation matrix given a set
; of observed Cartesian vectors and a set of known cartesian
; vectors.

n = 100 ; number of 'observations'

v = [1.0d, 0.15, 0.5] ; template vector
xyz_obs = dblarr(n, 3) ; observations
for i=0, n-1 do $
  xyz_obs[i,*] = reform( v+0.01*randomn(seed,3), 1, 3)

xyz_known = dblarr(n, 3) ; known values (trivial scaling)
for i=0, n-1 do $
  xyz_known[i,*] = reform( v*2.0, 1, 3)

; Estimate the transformation matrix, T
T0 = identity(3, /DOUBLE) ; initial guess transformation matrix
f = {x: xyz_obs, y: xyz_known, err: 0.01}
T = mpfit('trans', T0, functargs=f, COVAR=S2)

end
```