Subject: MPFIT: 95% Confidence Interval ?
Posted by limiqt on Wed, 11 Feb 2015 00:20:39 GMT

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Hi everyone,

I was wondering if someone knows how to plot the 95% CI using the MPFIT curve fitting (http://www.physics.wisc.edu/~craigm/idl/fitting.html).

In the example I can fit my model but now I need to plot the 95% CI as well as the prediction intervals.

```
;====
Pro fitmydata

X=[1,  2, 3,  4,  5,  6,  7,  8,  9,  10]
Y=[5, 10, 6, 20, 30, 20, 60, 90, 70, 100]

expr='P[0]*(X^P[1])'
start = [1D, 0.5]
Yfit = MPFITEXPR(expr,  X, Y, 1, start)
fitS=Yfit(0)*(X^Yfit(1))

cgwindow
cgplot, X, Y, psym=16,symsize=1, /noerase, /AddCMD
cgoplot,X, fitS, thick=2, color='red',/AddCMD

End

;====
```

I will appreciate any assistance,

Thanks,

Lim

Subject: Re: MPFIT: 95% Confidence Interval ?
Posted by Phillip Bitzer on Wed, 11 Feb 2015 17:36:02 GMT

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On Tuesday, February 10, 2015 at 6:20:42 PM UTC-6, Lim wrote:
> Hi everyone,
>
> I was wondering if someone knows how to plot the 95% CI using the MPFIT curve fitting (http://www.physics.wisc.edu/~craigm/idl/fitting.html).
>

According to the documentation, you can return the covariance matrix. From there, you can find the CI you're looking for (given some assumptions about how everything is distributed, of course.)

Might be a good idea to curl up with a good stats book. Bevington is good one to start with...

Subject: Re: MPFIT: 95% Confidence Interval ?
Posted by Craig Markwardt on Wed, 11 Feb 2015 21:44:10 GMT
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On Tuesday, February 10, 2015 at 7:20:42 PM UTC-5, Lim wrote:
> Hi everyone,
>
> I was wondering if someone knows how to plot the 95% CI using the MPFIT curve fitting
(http://www.physics.wisc.edu/~craigm/idl/fitting.html).
>
> In the example I can fit my model but now I need to plot the 95% CI as well as the prediction intervals.

For advanced usage I recommend using MPFITFUN instead of MPFITEXPR. Both functions return the 1-sigma standard errors with the PERROR keyword, and the covariance matrix with the COVAR keyword.

The MPPROPERR function can produce propagated confidence limits on your model function. An example is included in the documentation.

Note that 68% confidence is +/- 1 sigma, and
  95% confidence is +/- 2 sigma, so just multiply the 1-sigma errors by 2.

I should also say that in my field of research, it's not simply enough to compute the parameter errors via the covariance matrix. Usually one does a parameter grid search. Numerical Recipes discusses this type of work.

Craig