## Subject: Re: On errors calculated by curve-fitting routines Posted by Gernot Hassenpflug on Tue, 11 Mar 2008 09:35:57 GMT View Forum Message <> Reply to Message

Craig Markwardt <craigmnet@REMOVEcow.physics.wisc.edu> writes:

- > Gernot Hassenpflug <gernot@nict.go.jp> writes:
- >> I'd just like to ask, since I cannot quite tell if I have grasped the
- >> ideas from Numeric Recipes correctly (and so my own IDL code for
- >> comparison with the others may be incorrect): the covariance matrix
- >> calculation uses the basis functions (e.g., 1, x, x^2) and the
- >> variances of the dependent (y) variable, but \*not\* the dependent
- >> variable itself nor any quantitative measures of the goodness of the
- >> fitting process (presumably the variances of the dependent variable
- >> are supposed to contain all such information in theory).

>

- > That is the formal definition of the covariance matrix, assuming the
- > measurement uncertainties are appropriate.

Thank you, it seems that as far as that goes, I have understood (formally) the issue well enough that IDL and my hand-done calculations give the same output. Hoorah!

- >> I ask this because other methods, such as that used by Maple, seem to
- >> scale their result by the residual sums of squares, for example. I am
- >> still awaiting the book by Bevington (can only get 1st edition from
- >> library services, so need to purchase 2nd edition) and the one by
- >> Himmelblau from 1970 which is the basis of the Maple method.

>

- > This approach \*could\* be appropriate. The reasoning is that although
- > the fit is formally of bad quality -- indicated by a statistically
- > unacceptable chi-square value -- you \*assume\* that the fit is good.
- > You do this by multiplying the uncertainties by SQRT(CHI^2 / DOF),
- > which produces a modified reduced chi-square value of 1. That may not
- > always be appropriate, and it depends mostly upon scientific
- > judgement.

OK, I will have to read up more on that, just received Bevington's First Edition today, and got the later edition on the weekend to peruse. Very nice easy-to-follow explanatory chapters on what I need to fill in the gaps in my understanding.

It is funny how after I left IDL for a while to enjoy the ease of the GUI and object graphics manipulation in Maple, and the symbolic maths of Mathematica, I come back to IDL for the features that are either not in the other programs or only available separately at a further fee. I guess that is the world of commercial applications, and there is no excuse for not understanding how the undelrying maths and

statistics works.

BOFH excuse #371:

Incorrectly configured static routes on the corerouters.