Subject: LMFIT -- stay away from it!
Posted by Wayne Landsman on Sat, 31 Jan 1998 08:00:00 GMT
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A while back I posted a complaint about LMFIT, the IDL implemention of the Numerical Recipes version of the Levenberg-Marquardt non-linear least-squares algorithm. I complained that the form of the user-supplied function was different and less flexible than that of CURVEFIT. In fact, there is a more fundamental problem with LMFIT. Although the documentation says that the user-supplied function should accept a vector argument, **only scalar arguments are ever passed to the user-supplied function**! Thus, if one is fitting a function of 2000 points, then there must be 2000 calls to the user-supplied function on each iteration. And thus with a computationally intensive function, LMFIT will be about 2000 times slower than fitting with CURVEFIT.

The same problem occurs in the IDL implementation of the Numerical Recipes routines QSIMP. But the problem is more disatrous in LMFIT, which requires more iterations and partial derivative computations.

My advice -- forget about LMFIT, and stick with CURVEFIT (or write your own implementation of the Numerical Recipes routine).

--Wayne Landsman landsman@mpb.gsfc.nasa.gov

Subject: Re: LMFIT
Posted by Craig Markwardt on Mon, 13 Dec 1999 08:00:00 GMT
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"Alberto Verga" <verga@marius.univ-mrs.fr> writes:
> I tried the following example on the use of LMFIT given in the IDL 5.2
> help:
>
> ...example removed...
>
> I obtained
> % LMFIT: Warning: Failed to Converge.
>
> and in consequence a bad fit!
> Does anyone known if this LMFIT is correctly implemented?

"Correct" is a matter of debate. Designing an algorithm for curve fitting appears to be as much art as it is science. The procedures supplied by IDL are somewhat of a mixed bag:

CURVEFIT - quick and dirty. Quick because it runs fast. Dirty, perhaps, because it doesn't always converge. The best if

judged in EASY and SPEED categories.

LMFIT - slow and dirty. Slow because function calls are done in FOR loops (astounding!). If there are convergence problems, it's probably because LMFIT is based on Numerical Recipes.

I recommend you try MPFIT and related functions (web page below). I have translated these from the original MINPACK-1 package, which was designed by a real numerical analyst! I value reliability more than absolute speed and was willing to make a compromise.

I have found the results to be very reliable in my own work, and I have gotten similar comments from other researchers. For your application I clearly recommend MPFIT and the driver function MPFITFUN.

Craig
http://cow.physics.wisc.edu/~craigm/idl/idl.html

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