Subject: Re: Challenging question - array curve fitting
Posted by Craig Markwardt on Thu, 29 Mar 2007 15:07:38 GMT
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"Qing" <csis@bigpond.net.au> writes:

> G'day folks,
>
> I have a time series of images represented by a 3D array as Data(Nx,
> Ny, Nt) or Data (Nt, Nx, Ny). I would like to apply a non-linear curve
> fitting to the time dimension for every pixel respectively. I can loop
> through every pixel using 1-D curve fitting procedure, but the process
> is slow and it does not make efficient use of multiple CPUs.
>
> Theoretically I would think it should be feasible to perform curve
> fitting for all pixels simultaneously via matrix operation? However,
> all the IDL's fitting routines only accept vectors for input
> parameters to my knowledge. Does anyone know if there is any non-
> linear fitting routines that accept array parameters. Or can anyone
> comment on whether such a routine is feasible at all?

Greetings, there should be nothing stopping you from grouping multiple time series into a single large vector, and fitting them simultaneously. You just need to make your model function smart enough to know what to do with the concatenated data set.

However, there is a point of diminishing returns. Since the number of arithmetic operations required to perform the fit scales as the number of pixels *cubed*, there is really no advantage to grouping large numbers of pixels together, in fact there may be a disadvantage. This depends on the number of times (your Nt), but since we don't know that number, you will have to find the right balance yourself.

Good luck,
Craig

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