Subject: Re: getting derivatives from spline
Posted by jameskuyper on Mon, 13 Apr 2009 16:54:05 GMT
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Jeremy Bailin wrote:
> Does anyone know a way of getting SPLINE or any of its friends to
> return the derivatives of the interpolating function at the desired
> abscissae in addition to the interpolated values?
>
> Or, another way of getting at this question: what is everyone's
> favourite algorithm for numerically calculating the derivatives of
> (slightly) noisy data?

Don't use splines to fit noisy data. The spline treats the noise as being just as real as the signal. Particularly with higher-order splines, it's easy to end up with interpolated data which looks even noisier than the raw data.

Instead, fit the noisy data to a model with fewer free parameters than you have data points. The difference between the number of data points and the number of free parameters is a measure of the amount of information you're discarding. If you've made a good choice of model, the information you're discarding will be about the noise; with a bad model, you'll be discarding information about the signal. Choosing the right model for your data is therefore a key step in this process.

The fundamental problem with using splines is that the number of data points is the same as the number of free parameters - you aren't discarding any noise.