Subject: Re: "Correct" Data Philosophy
Posted by David Fanning on Thu, 17 Dec 2009 21:56:56 GMT
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Kenneth P. Bowman writes:

> The problem of estimating values where you have no data is
> very common and often very difficult. The best approach depends
> on the character of the data, the size of the gaps, the methods used,
> and the purpose of the analysis.
>
> It is very important to not mislead yourself or your readers.
> My first recommendation is *not* to fill gaps whenever possible --
> instead, adapt your analysis and display methods to the data.
> If you are displaying an image or contour, for example, show
> the viewer where the data is missing with a special color
> and don't display contours where there is no data.
>
> If I am plotting global maps of 5 deg x 5 deg data, it should
> look chunky (pixelated), not smooth. That reminds the viewer
> what the actual resolution of the data is.
>
> If you need to do a Fourier transform, consider using
> least-squares estimation rather than interpolating
> and using an FFT.
>
> If the data is smooth and the gaps are small, interpolation
> will probably work well. If the data is noisy and the gaps are
> large, it is possible that nothing will work well.
>
> If you do fill gaps, always test the impact on your results.
> Does it matter whether you use linear or cubic interpolation,
> for example?
>
> In the end, you need to be confident that your results do not
> depend significantly on how you chose to estimate the missing
> data.

OK, here is my problem: I don't have any idea what you
people are talking about. And neither do the folks asking
me questions. :-(

This, in particular, is opaque to me:

> If you need to do a Fourier transform, consider using
> least-squares estimation rather than interpolating
> and using an FFT.

OK, I will, but *how*!?

> Is it similar to "interpolation" or "approximation" or "estimation"?

Yeah, it's similar to all of those, I guess. But, how
would you do it in IDL?

> How about linear/bilinear/trilinear interpolation? Or minimum
> curvature surface or thin-plate-spline? It also depends on how many
> values are available and/or missing. There are other fitting/
> interpolation functions too.

Does IDL even *do* these things!? Or do I have to go learn
Matlab?

I guess I was hoping for a couple of examples. I really don't
have the time or energy to open up a whole new research area
here, although I can see that it might occupy my time quite
fruitfully for a number of years. :-(

Cheers,

David

--
David Fanning, Ph.D.
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Coyote's Guide to IDL Programming: http://www.dfanning.com/
Sepore ma de ni thui. ("Perhaps thou speakest truth.")
