
Subject: Error Bar Thoughts

Posted by [David Fanning](#) on Wed, 02 Feb 2011 17:50:24 GMT

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Folks,

Since I am parallelized in uncertainty as I look at my growing list of things to do, I've decided to blow off some steam by doing something fun. I've decided to add error bars to my `cgPlot` routine. (Fun *and* it knocks an item off my list!)

But, here is my dilemma. I don't typically use error bars. :-)

So here is my question. How would people (presumably those people who DO use error bars, please!) want to specify the location of the high and low locations of the bar? As an offset from the data point?

```
data = 5
errlow = 0.1
errhigh = 0.2
```

As a data value itself?

```
data = 5
errlow = 4.9
errhigh = 5.2
```

What is the usual thing? Do I need an `ERROFFSET` flag to indicate one or the other?

Please reply soon. I have nothing else to do. :-)

Cheers,

David

--

David Fanning, Ph.D.

Fanning Software Consulting, Inc.

Coyote's Guide to IDL Programming: <http://www.idlcoyote.com/>

Sepore ma de ni thui. ("Perhaps thou speakest truth.")

Subject: Re: Error Bar Thoughts

Posted by [Gray](#) on Wed, 02 Feb 2011 20:22:47 GMT

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On Feb 2, 3:14 pm, David Fanning <n...@dfanning.com> wrote:

> Matt writes:
>> I second this motion. And I'd prefer actual values rather than
>> offsets, but it's an easy enough operation to be able to figure out.
>
> Yeah, actual data makes sense to me, too. And it means
> I don't have to fool around too much with philosophical
> discussions about whether up is down or visa versa. Plus,
> it's easy enough it might even happen in the next hour
> or two. :-)
>
> Cheers,
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> David
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> David Fanning, Ph.D.
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It's funny, offsets make more sense to me because that's how results
are usually quoted: 1.05+0.02-0.06

Subject: Re: Error Bar Thoughts

Posted by [David Fanning](#) on Wed, 02 Feb 2011 20:32:47 GMT

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Gray writes:

> It's funny, offsets make more sense to me because that's how results
> are usually quoted: 1.05+0.02-0.06

Another advantage of making the errors actual values, though,
is that it increases the change that the length of the
data vectors and the length of the error vectors will match.
Always a consideration. :-)

Cheers,

David

--

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Subject: Re: Error Bar Thoughts
Posted by [wlandsman](#) on Wed, 02 Feb 2011 21:26:33 GMT
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On Wednesday, February 2, 2011 12:50:24 PM UTC-5, David Fanning wrote:

> to specify the location of the high and low locations
> of the bar? As an offset from the data point?

For what it is worth, the ITTVIS supplied procedure PLOTERR specifies the error as an offset from the data point, but the ITTVIS supplied ERRPLOT wants the low and high values. In my own work, errors are nearly always supplied as a offset (e.g. Poisson errors are a square root of the counts). Note that users often want to display X along with Y error bars.

The two most difficult parts of writing my own PLOTERROR (<http://idlastro.gsfc.nasa.gov/ftp/pro/plot/ploterror.pro>) were handling the X/YLOG and NSUM keywords to PLOT. You don't want the entire logarithmic plot to abort because one of the error bars extends to negative numbers, and you want to appropriately reduce the size of the error bars when summing data together. ---Wane

Subject: Re: Error Bar Thoughts
Posted by [David Fanning](#) on Wed, 02 Feb 2011 23:16:33 GMT
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Wayne Landsman writes:

>
> On Wednesday, February 2, 2011 12:50:24 PM UTC-5, David Fanning wrote:
>
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bars extends to negative numbers, and you want to appropriately reduce the size of the error bars when summing data together. ---Wane

OK, tell me again why I am re-inventing this wheel!?
Or, the Legend wheel, for that matter.

It seems to me that if there are good routines out there like this we ought be be able to just make them work with Coyote Graphics routines. It's pretty simple, really.

It seems to me I should be spending my time inventing a Coyote Seal of Approval that we could attach to good routines that handled colors correctly and could be used in resizable graphics windows. Then everyone could be working on this and I could get back to doing what I do best: drinking lattes. Maybe I could make a web page with pointers to these routines so they are easy to find.

Just a thought. :-)

Cheers,

David

--

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Subject: Re: Error Bar Thoughts
Posted by [Paul Van Delst\[1\]](#) on Thu, 03 Feb 2011 00:48:26 GMT
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Gray wrote:

> On Feb 2, 3:14 pm, David Fanning <n...@dfanning.com> wrote:
>> Matt writes:
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> are usually quoted: 1.05+0.02-0.06

seconded.

Using actual data values as input means the user will pretty much *always* have to convert the values since I have never (well, very very rarely) seen error estimates reported as anything other than +/- offset values. But I think different fields will have their favourite way so whatever you choose you'll get complaints. :o)

Apart from that, if the user passes the offset in as, e.g., a 2-element array for each data point then, if the position

is important the first one is the +ve delta, the second one is the -ve delta. Just plot `datavalue+abs(errest[0])` and `datavalue-abs(errest[1])`.

If the position isn't considered indicative of the value being a +ve or -ve delta, then the user is responsible for supplying the sign of the error and just plot from value to value, i.e. `datavalue+errest[0]` to `datavalue+errest[1]`

I prefer the latter since relying on data position makes me uneasy (I'll forget the "rule").

cheers,

paulv

Subject: Re: Error Bar Thoughts
Posted by [Jeremy Bailin](#) on Thu, 03 Feb 2011 12:19:08 GMT
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I fall into the actual value camp. I've had lots of times when I've wanted to plot an error bar without a central value, and it feels far more forced to try to come up with a central value to +/- from there

than to calculate the actual values for the end points when you have an uncertainty.

But I heartily agree that you should just pick one and let the user do what they need in order to get it in the right format. It's not difficult either way.

-Jeremy.
