Subject: Re: CURVEFIT for multiple datasets
Posted by Spon on Thu, 31 Jan 2008 14:15:40 GMT
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On Jan 31, 12:55 pm, chloesharro...@gmail.com wrote:
> Dear all
>
> I'm trying to fit an exponential curve to multiple data sets which
> have been overplotted on a graph. To get a feel for CURVEFIT (as I'm
> a novice at IDL and CURVEFIT), I wrote the following 2 programs (based
> on the one given in IDL help), which produce a nice exponential curve
> when there's only ONE dataset:
>
> =====
> PRO gfunct, x, t_a, f_t, PDER
>
> t_bx = EXP(t_a[1]*x)
> f_t = t_a[0] * (t_bx) + t_a[2]
>
> ;If the procedure is called with four parameters, calculate the
> partial derivatives
> IF N_PARAMS() GE 4 THEN $
> pder = [[t_bx], [t_a[0]*x*t_bx], [replicate(1.0, N_ELEMENTS(x))]]
>
> END
> =====
> and
> =====
> PRO CURVE_FITTING
> x=FLOAT(indgen(10))
> y=[12.0, 11.0, 10.2, 9.4, 8.7, 8.1, 7.5, 6.9, 6.5, 6.1]
> weights=1.0/y ;Define a vector of weights
> A=[10.0, -0.1, 2.0] ;Provide an initial guess of the function's
> parameters
>
> yfit=CURVEFIT(x,y,weights, A, FUNCTION_NAME='gfunct') ;Compute the
> parameters
> print, 'Function parameters: ', A
>
> loadcolors
> pson, filename='Curve_fitting.ps'
> plot, x, y, yrange=[5,13], ystyle=1, xrange=[0, 11], xstyle=1, psym=1,
> color=0
> oplot, x, yfit, linestyle=1, color=5
> psoff
> END
> =====
>

> How can I extend this for the case when I have say 2data sets, ie:
> x=[[indgen(10)], [indgen(10)]]
> y=[[12.0, 11.0, 10.2, 9.4, 8.7, 8.1, 7.5, 6.9, 6.5, 6.1], [11.5, 10.8,
> 10.3, 9.5, 8.6, 7.8, 7.5, 6.4, 6.4, 5.9]
> and I want to plot an exponential curve through all of this data?
> Eventually, I would like my program to be able to plot an exponential
> curve through 2000+ data sets all of which have been plotted on the
> same graph and seem to show an exponential trend.
>
> Thanks very much
> Chloé

This doesn't really answer your question in any way, but if you're going to do a lot of curvefitting, I'd suggest having a look at Craig Markwardt's site:
http://cow.physics.wisc.edu/~craigm/idl/idl.html

His fitting programmes are faster and more robust than CURVEFIT in my (admittedly limited) experience, and it's certainly true that they don't crash and burn as easily as CURVEFIT does.

To try and answer your question, there's no way I can see of fitting more than one datapoint at a time using the method you describe. The brute force way involves wrapping the lot in (slow) FOR loops. The elegant and efficient way, if there is one, eludes me.

There may well be a way to use Craig's mpfit to help you here, but I don't know - perhaps someone else does?

> Eventually, I would like my program to be able to plot an exponential
> curve through 2000+ data sets all of which have been plotted on the
> same graph and seem to show an exponential trend.
It may also be worthwhile asking yourself if you really need a fitted curve to every single data set; or one curve that best fits the whole data (in which case I'd suggest looking at MOMENT or TOTAL, for example, before you do any curve fitting at all.) Maybe even something in between?

Hope this helps,
Chris

Subject: Re: CURVEFIT for multiple datasets
Posted by chloesharrocks on Thu, 31 Jan 2008 14:28:25 GMT
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Hi Chris

Thanks for your reply. I'm reluctant to use advanced fitting
programmes as I'm an undergraduate trying to do an MPhys Project and
I'd rather try and code as much as possible myself so I can get credit
for it.

Luckily, I have found a way to do a fit for 2datasets now - by
puttting them all into one big array, so hopefully I can extend this
further so I put 2000+ datasets in one array and then fit an
exponential to that new array.

Thanks for all your help
Chloé

Subject: Re: CURVEFIT for multiple datasets
Posted by David Fanning on Thu, 31 Jan 2008 14:37:51 GMT
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chloesharrocks@gmail.com writes:

> Thanks for your reply. I'm reluctant to use advanced fitting
> programmes as I'm an undergraduate trying to do an MPhys Project and
> I'd rather try and code as much as possible myself so I can get credit
> for it.

Oohh, totally the wrong attitude. You should try to steal the
best ideas you can, build on those, and become famous for giving
ideas away. Much better karma that way. :-)

Cheers,

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

Subject: Re: CURVEFIT for multiple datasets
Posted by Paul Van Delst[1] on Thu, 31 Jan 2008 16:13:35 GMT
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chloesharrocks@gmail.com wrote:
> Hi Chris
>
> Thanks for your reply. I'm reluctant to use advanced fitting

> programmes as I'm an undergraduate trying to do an MPhys Project and
> I'd rather try and code as much as possible myself so I can get credit
> for it.

Strange approach. Your ultimate goal should be to get the correct answer. That's much easier to do using software you can trust.

Besides, regardless of whether you use IDL's CURVEFIT, or Criag's MPFIT, you're still using "advanced fitting programmes" that you can't take credit for. You can take credit for writing the code that feeds those procedures the data, I guess.

> Luckily, I have found a way to do a fit for 2datasets now - by
> puttting them all into one big array, so hopefully I can extend this
> further so I put 2000+ datasets in one array and then fit an
> exponential to that new array.

What about taking the average of all your datasets (assume the same abscissa values) and fit that using the std dev's of each point as an error estimate?

cheers,

paulv

Subject: Re: CURVEFIT for multiple datasets
Posted by Spon on Thu, 31 Jan 2008 18:32:32 GMT
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On Jan 31, 4:13 pm, Paul van Delst <Paul.vanDe...@noaa.gov> wrote:
> chloesharro...@gmail.com wrote:
>> I'm an undergraduate trying to do an MPhys Project and
>> I'd rather try and code as much as possible myself so I can get credit
>> for it.
>
> Strange approach. Your ultimate goal should be to get the correct answer. That's much
> easier to do using software you can trust.
>
> Besides, regardless of whether you use IDL's CURVEFIT, or Criag's MPFIT, you're still
> using "advanced fitting programmes" that you can't take credit for. You can take credit
> for writing the code that feeds those procedures the data, I guess.

I completely agree - surely whether you use mpfitfun as programmed by Craig or curvefit as programmed by the guys at RSI (as it probably was when it was coded) makes no difference to how much credit you can take for it? The only difference is that the RSI guys probably got paid for their work!
Plus, as David mentioned, it's good for the soul, or something...

>> Luckily, I have found a way to do a fit for 2datasets now - by
>> puttting them all into one big array, so hopefully I can extend this
>> further so I put 2000+ datasets in one array and then fit an
>> exponential to that new array.

Could you expand please? I'm intrigued.
I only got as far as realising the elliptical input parameters to
GAUSS2DFIT were not what I was looking for before stumbling upon mpfit
which works very well for 2-dimensional datasets so long as you're
really sure you know what you're asking it to do. Never looked
back ;-)

>
> What about taking the average of all your datasets (assume the same abscissa values) and
> fit that using the std dev's of each point as an error estimate?
>
> cheers,
>
> paulv

take care,
Chris

Subject: Re: CURVEFIT for multiple datasets
Posted by Wox on Fri, 01 Feb 2008 09:14:57 GMT
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On Thu, 31 Jan 2008 04:55:11 -0800 (PST), chloesharrocks@gmail.com
wrote:

<snip>

> How can I extend this for the case when I have say 2data sets, ie:
> x=[[indgen(10)], [indgen(10)]]
> y=[[12.0, 11.0, 10.2, 9.4, 8.7, 8.1, 7.5, 6.9, 6.5, 6.1], [11.5, 10.8,
> 10.3, 9.5, 8.6, 7.8, 7.5, 6.4, 6.4, 5.9]
> and I want to plot an exponential curve through all of this data?

Euhm, I must be missing something here, but what's wrong with just
doing it. You are trying to fit 1 curve which fits best to all
datasets right? I.e. 3 parameters and not 3n parameters?

PRO CURVE_FITTING
x=[findgen(10),findgen(10)]
y=[12.0, 11.0, 10.2, 9.4, 8.7, 8.1, 7.5, 6.9, 6.5, 6.1, 11.5, 10.8,$

```
10.3, 9.5, 8.6, 7.8, 7.5, 6.4, 6.4, 5.9]

weights=1.0/y ;Define a vector of weights
A=[10.0, -0.1, 2.0] ;Provide an initial guess of the function's
parameters

yfit=CURVEFIT(x,y,weights, A, FUNCTION_NAME='gfunct') ;Compute the
parameters
print, 'Function parameters: ', A

plot, x, y, yrange=[5,13], ystyle=1, xrange=[0, 11], xstyle=1, psym=1

ind=sort(x)
oplot, x[ind], yfit[ind], linestyle=1, color=5
END;PRO CURVE_FITTING
```