Subject: Curvefit
Posted by zanotti on Wed, 21 May 1997 07:00:00 GMT
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Hi,

I use CURVEFIT (on PV-WAVE CL Version 6.05 (sun4 solaris sparc)) to perform non-linear least sqares fitting. It works rather well, but once the fit is performed, the vector of standard deviations for parameters (named Sigmaa) seems to give very large values:
for a given set of data, the error on parameters is ten times greater with Curvefit than, for exemple, with Kaleidagraph.

In fact, Curvefit is based on the Gradient-expansion algorithm, and the way the programm calculates the error (i.e SIGMAA = SQRT(ARRAY(DIAG)/ALPHA(DIAG))) is perharps wrong (something missing ???).

Does anybody has an idea ?

Thanks for help.

J.Marc


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_/_/_/_/            Jean-Marc Zanotti      _/ _/_/_/
_/_/_/_/       Laboratoire Leon Brillouin    _/_/_/_/
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_/_/_/_/   Email: zanotti@bali.saclay.cea.fr _/_/_/_/
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Subject: Re: Curvefit
Posted by thompson on Wed, 21 May 1997 07:00:00 GMT
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zanotti@bali.saclay.cea.fr (J.M. Zanotti) writes:

> Hi,

> I use CURVEFIT (on PV-WAVE CL Version 6.05 (sun4 solaris sparc)) to perform
> non-linear least sqares fitting. It works rather well, but once the fit is
> performed, the vector of standard deviations for parameters (named Sigmaa)
> seems to give very large values:

> for a given set of data, the error on parameters is ten times greater with
> Curvefit than, for exemple, with Kaleidagraph.

> In fact, Curvefit is based on the Gradient-expansion algorithm, and the way
> the programm calculates the error (i.e SIGMAA = SQRT(ARRAY(DIAG)/ALPHA(DIAG))
>) is perharps wrong (something missing ???).

> Does anybody has an idea ?

It probably depends on the weighting function that you give it. If the weights
are related to true errors on the measurements, i.e. 1/sigma^2, then the SIGMAA
values should normally be realistic. However, if the weights have an arbitrary
normalization, then the SIGMAA values will also be off. A good test is to look
at the chi-squared value, which is returned in the keyword CHI2. Realistic
weights should result in a chi-squared close to 1. If far away from 1, then
the SIGMAA values will be off as well. One way to adjust for this is to
multiply the SIGMAA values by SQRT(CHI2).

Bill Thompson

Subject: Re: curvefit
Posted by David Fanning on Wed, 08 Jan 2003 04:13:05 GMT
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tom (tom2959@21cn.com) writes:

> there are only two program in IDL which can be used to fit curves with
> non-linear least squares method. Sometimes they work not well. Are there any
> other programs to do such work?

I'd have a look at Curve Fit Central:

  http://cow.physics.wisc.edu/~craigm/idl/fitting.html

Cheers,

David

--
David W. Fanning, Ph.D.
Fanning Software Consulting, Inc.
Phone: 970-221-0438, E-mail: david@dfanning.com
Coyote's Guide to IDL Programming: http://www.dfanning.com/
Toll-Free IDL Book Orders: 1-888-461-0155

Subject: Re: CURVEFIT
Posted by K. Bowman on Wed, 02 Jun 2004 15:56:43 GMT
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In article <c9krj3$3r5$1@news.urz.uni-heidelberg.de>,
 Andreas Ernst <aernst@ari.nis> wrote:

> Hi,
>
> (1) I am using CURVEFIT to fit a straight line
> through my data points.>

> (2) I had problems with fitting data points with
> polynomials higher than third order, like fourth
> or fifth order. Is this problem known?

For polynomial fits, you could try REGRESS (or LINFIT or POLY_FIT).

Ken Bowman

Subject: Re: CURVEFIT
Posted by Craig Markwardt on Wed, 02 Jun 2004 18:40:37 GMT
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Andreas Ernst <aernst@ari.nis> writes:

> Hi,
>
> (1) I am using CURVEFIT to fit a straight line
> through my data points. My user-supplied
> function looks like this:
>
> PRO gerade, X, A, F, PDER
> F=A[0]+A[1]*X
> IF N_PARAMS() GE 4 THEN $
>   PDER = [[REPLICATE(1.0, N_ELEMENTS(X))], [X]]
> RETURN
> END
>
> Anyway, even though it defines a straight line,
> the routine CURVEFIT seems to fit some other
> curve through the data points, which is something

A linear fit is trivial, and CURVEFIT shouldn't produce problems like
you found. My guess is that it is more likely that you have a data
handling problem. For example, if you perform a data selection on the
X values but forget to do the same for the Y values.

As the other poster said, you can use LINFIT/POLYFIT* to do the simple
fits you desire.

For more complicated fits, or as a cross check, you can use my own
fitting program, MPFIT + MPCURVEFIT, which have a wide acknowledgement
in the IDL community. As a combination, they are a drop-in
replacement for CURVEFIT (although if you don't have the requirement
to keep CURVEFIT compatibility, then I recommend using MPFITFUN).

Happy fitting!

Craig

--
--- --------------
Craig B. Markwardt, Ph.D. EMAIL: craigmnet@REMOVEcow.physics.wisc.edu
Astrophysics, IDL, Finance, Derivatives | Remove "net" for better response
--- --------------

Subject: Re: curvefit
Posted by Benjamin Hornberger on Mon, 13 Jun 2005 19:46:33 GMT
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nolan.smith1@gmail.com wrote:
> Hello,
>
> I am new in IDL and I am trying to fit my data (x,y coordinates) in a
> function of this form:
>
> y(x)=A/[(1+x/B)^1/2]^2
>
> so that I can calculate A and B.
>
> I have read the documentation but I am very confused as to how I should
> set up my function to use it at the curvefit.
> Could you please explain to me how to set up the function and how to
> use curvefit correctly?
>
> Thank you,
> Nolan Smith
>

Most people use Craig Markwardt's fitting routines rather than the ones
provided with IDL:

http://cow.physics.wisc.edu/~craigm/idl/idl.html

Good luck,
Benjamin

Subject: Re: curvefit
Posted by nolan.smith1 on Mon, 13 Jun 2005 19:59:36 GMT
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Thank you. I had already looked at those routines as well but the
problems I had with those routines were the same with the curvefit
routine.
I do not know how set up the function correctly and use it in the
curvefit or mpcurvefit program.

Any help will be greatly appreciated.

Thank you,
Nolan

Subject: Re: curvefit
Posted by kashyap on Mon, 13 Jun 2005 21:50:12 GMT
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In article <1118691431.765056.244800@f14g2000cwb.googlegroups.com>,
 <nolan.smith1@gmail.com> wrote:
> Hello,
>
> I am new in IDL and I am trying to fit my data (x,y coordinates) in a
> function of this form:
>
> y(x)=A/[(1+x/B)^1/2]^2
>
> so that I can calculate A and B.
>
> I have read the documentation but I am very confused as to how I should
> set up my function to use it at the curvefit.
> Could you please explain to me how to set up the function and how to
> use curvefit correctly?
>
> Thank you,
> Nolan Smith
>

Create a new procedure, say testfun.pro:

```
pro testfun,x,y,par,dfdpar
y=par[0]/((1+x/par[1])^(1./2.))^2
 ;question: why is this not y=par[0]/(1+x/par[1]) ?
dfdpar=fltarr(n_elements(x),2)
dfdpar[*,0]=y/par[0]
dfdpar[*,1]= {partial}y/{partial}B ..
 ;calculation left as an exercise for the reader!
return
end
```

and then call curvefit as
```
yfit=curvefit(x,y,weights,par,function_name='testfun')
```

vinay
--

_____
kashyap@head.cfa.harvard.edu 617 495 7173 [CfA/P-145] 617 496 7173 [F]

Subject: Re: curvefit
Posted by Craig Markwardt on Mon, 13 Jun 2005 22:24:38 GMT
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nolan.smith1@gmail.com writes:
> Thank you. I had already looked at those routines as well but the
> problems I had with those routines were the same with the curvefit
> routine.
> I do not know how set up the function correctly and use it in the
> curvefit or mpcurvefit program.

Greetings,

Did this tutorial page not help?
http://cow.physics.wisc.edu/~craigm/idl/mpfittut.html

Yours,
Craig

--
---------- ----------
Craig B. Markwardt, Ph.D. EMAIL: craigmnet@REMOVEcow.physics.wisc.edu
Astrophysics, IDL, Finance, Derivatives | Remove "net" for better response
---------- ----------

Subject: Re: curvefit
Posted by nolan.smith1 on Tue, 14 Jun 2005 03:07:34 GMT
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It was really helpful. I just wanted a little more details on how to
set up the function but now I understand it better.
Thank you for the help,
Nolan

Subject: Re: curvefit
Posted by nolan.smith1 on Tue, 14 Jun 2005 04:02:00 GMT
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Thank you!
I had a little typo in the function that I gave you,
it is y(x)=A/(1+x/B)^2.
Your answer was really helpful so thanks again!!!

Nolan

Vinay L. Kashyap wrote:
> In article <1118691431.765056.244800@f14g2000cwb.googlegroups.com>,
> <nolan.smith1@gmail.com> wrote:
>> Hello,
>>
>> I am new in IDL and I am trying to fit my data (x,y coordinates) in a
>> function of this form:
>>
>> y(x)=A/[(1+x/B)^1/2]^2
>>
>> so that I can calculate A and B.
>>
>> I have read the documentation but I am very confused as to how I should
>> set up my function to use it at the curvefit.
>> Could you please explain to me how to set up the function and how to
>> use curvefit correctly?
>>
>> Thank you,
>> Nolan Smith
>>
>
> Create a new procedure, say testfun.pro:
>
> pro testfun,x,y,par,dfdpar
> y=par[0]/((1+x/par[1])^(1./2.))^2
> ;question: why is this not y=par[0]/(1+x/par[1]) ?
> dfdpar=fltarr(n_elements(x),2)

> dfdpar[*,0]=y/par[0]
> dfdpar[*,1]= {partial}y/{partial}B ..
> ;calculation left as an exercise for the reader!
> return
> end
>
> and then call curvefit as
> yfit=curvefit(x,y,weights,par,function_name='testfun')
>
> vinay
> --
> _____
_____
> kashyap@head.cfa.harvard.edu 617 495 7173 [CfA/P-145] 617 496 7173 [F]

Subject: Re: curvefit
Posted by nolan.smith1 on Tue, 14 Jun 2005 15:20:58 GMT
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I spoke too soon!
So I have set up my function:
(the model I am trying to fit is y=a/((1+(x/b))^2))

```
FUNCTION myfun,X,P
RETURN,P(0)/(1+(X/P(1))^2)
END
```

and then I try to run

```
 result=MPFITFUN('myfun',x,y,0.5,0.01)
```

Where x,y are my x,y coordinates of the data that I am trying to fit,
0.5 is the first guess for P(0) and 0.01 is the first guess for P(1).
As you guessed it is not working. What am I doing wrong?

Thank you,
Nolan

Subject: Re: curvefit
Posted by Paolo Grigis on Tue, 14 Jun 2005 16:16:38 GMT
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nolan.smith1@gmail.com wrote:
> I spoke too soon!
> So I have set up my function:

> (the model I am trying to fit is y=a/((1+(x/b))^2))
>
> FUNCTION myfun,X,P
> RETURN,P(0)/(1+(X/P(1))^2)
> END
>
> and then I try to run
>
> result=MPFITFUN('myfun',x,y,0.5,0.01)

The 4th argument should be an array with the errors on y and the
5th argument an array with the estimates for the parameters,
so try something like:

```
err=replicate(1,n_elements(x));constant errors in y
par=[0.5,0.01];parameter estimate

result=MPFITFUN('myfun',x,y,err,par)
```

>
> Where x,y are my x,y coordinates of the data that I am trying to fit,
> 0.5 is the first guess for P(0) and 0.01 is the first guess for P(1).
> As you guessed it is not working. What am I doing wrong?
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> Thank you,
> Nolan
>