Subject: Question about tutorial in 1D Gaussian Filter
Posted by coraluk on Mon, 30 Jul 2001 07:30:52 GMT
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I want to use a 1D Gaussian Filter to fit a curve. After visiting the tutorial about 1D Curve fitting in IDL, I still found some problems in the function gauss1. Following are the questions:

1) What is the return of "size(x)"?

2) What is meant by "!dpi"?

Yours,
Cora

Subject: Re: Question about tutorial in 1D Gaussian Filter
Posted by air_jlin on Mon, 30 Jul 2001 20:44:49 GMT
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hi Cora,

coraluk@hkpc.org (Cora) wrote in message news:<b19810c5.0107292330.37dd66aa@posting.google.com>...
> I want to use a 1D Gaussian Filter to fit a curve. After visiting the
> tutorial about 1D Curve fitting in IDL, I still found some problems in
> the function gauss1. Following are the questions:
>
> 1) What is the return of "size(x)"?
>
> 2) What is meant by "!dpi"?
>
>
> Yours,
> Cora
>
SIZE returns information (e.g. array size, type, etc.) about the variable x. !dpi is a system variable that contains the double precision value of pi. for more info., both are described in more detail on the online help.

best,
-Johnny

Johnny Lin

CIRES, University of Colorado
Work Phone: (303) 735-1636
Web: http://cires.colorado.edu/~johnny/

Subject: Re: Question about tutorial in 1D Gaussian Filter
Posted by Craig Markwardt on Mon, 30 Jul 2001 21:56:30 GMT
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coraluk@hkpc.org (Cora) writes:

> I want to use a 1D Gaussian Filter to fit a curve. After visiting the
> tutorial about 1D Curve fitting in IDL, I still found some problems in
> the function gauss1. Following are the questions:
>
> 1) What is the return of "size(x)"?
>
> 2) What is meant by "!dpi"?

Cora, GAUSS1 is my program, so perhaps I should respond.

I should be clear first of all, that computing the gaussian *should*
be as simple as EXP(-Z^2/2). Unfortunately, the exponential function
is sensitive to underflow warnings. If Z is too large, then
EXP(-Z^2/2) will underflow. My personal wish is that this would yield
zero silently, but that is not what happens.

All of the code you see in GAUSS1 is designed to avoid the warning,
but maintain as much precision as possible. The SIZE function is used
to determine the dimension and data type of a variable. I use it that
function to decide whether the data is FLOAT or DOUBLE. You can look
up !DPI in the manual under system variables.

If you like, a function like the following one may be easier to
understand, but will produce underflow warnings:

```
FUNCTION SIMPLEGAUSS, X, P
  return, P(2)*EXP(-(X-P(0))^2/(2.*P(1)^2))
END
```

Good luck,
Craig

--
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Craig B. Markwardt, Ph.D. EMAIL: craigmnet@cow.physics.wisc.edu
Astrophysics, IDL, Finance, Derivatives | Remove "net" for better response
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Subject: Re: Question about tutorial in 1D Gaussian Filter
Posted by coraluk on Tue, 31 Jul 2001 06:15:14 GMT
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Craig Markwardt <craigmnet@cow.physics.wisc.edu> wrote in message
news:<onr8uygjxs.fsf@cow.physics.wisc.edu>...
> coraluk@hkpc.org (Cora) writes:
>
>
>> I want to use a 1D Gaussian Filter to fit a curve. After visiting the
>> tutorial about 1D Curve fitting in IDL, I still found some problems in
>> the function gauss1. Following are the questions:
>>
>> 1) What is the return of "size(x)"?
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>
>
> Cora, GAUSS1 is my program, so perhaps I should respond.
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> I should be clear first of all, that computing the gaussian *should*
> be as simple as EXP(-Z^2/2). Unfortunately, the exponential function
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>
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> up !DPI in the manual under system variables.
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> If you like, a function like the following one may be easier to
> understand, but will produce underflow warnings:
>
> FUNCTION SIMPLEGAUSS, X, P
> return, P(2)*EXP(-(X-P(0))^2/(2.*P(1)^2))
> END
>
> Good luck,
> Craig

Thank you for your answers. However, there are some follow up

questions after using the function simplegauss. (I have added some checking to avoid underflow and overflow)

In the function simplegauss, I only need to input my X values, mean and sd of Y, and the area. Then I get a bell shape of a gaussian distribution. Is this a correct result of function simplegauss? If yes, then how can this result apply to my data to get a best fit, smooth curve.

Yours,
Cora

Subject: Re: Question about tutorial in 1D Gaussian Filter
Posted by Craig Markwardt on Tue, 31 Jul 2001 15:08:15 GMT
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coraluk@hkpc.org (Cora) writes:
>> FUNCTION SIMPLEGAUSS, X, P
>> return, P(2)*EXP(-(X-P(0))^2/(2.*P(1)^2))
>> END

Hi Cora--

Here are the parameters P to SIMPLEGAUSS. Unlike GAUSS1, the final parameter is simply the maximum value, not the area under the curve. It's "simple" after all.

P(0) - position of centroid
P(1) - gaussian sigma
P(2) - maximum amplitude (not area of curve)

To use it, check out the tutorial, and try something like this:

```
p = mpfitfun('SIMPLEGAUSS', x, y, err, p0)
bestfit = simplegauss(x, p)
```

Much of this information is in the "frequently asked questions" for the web page. Or, you can download MPFITPEAK, which is a function specifically designed for fitting gaussian and other type peaks to data. It automatically returns the best fit curve.

Craig

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

--

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