Subject: Compare non-linear function fit parameters of two data sets
Posted by suruchi on Sun, 15 Nov 2015 10:21:20 GMT
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If we have two different sample datasets and we fit a non-linear function to these two datasets (for example an exponential function AB^x +C), then how do we compare the two fits?

Subject: Re: Compare non-linear function fit parameters of two data sets
Posted by Craig Markwardt on Mon, 16 Nov 2015 19:26:06 GMT
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On Sunday, November 15, 2015 at 5:21:22 AM UTC-5, suruchi wrote:
> If we have two different sample datasets and we fit a non-linear function to these two datasets (for example an exponential function AB^x +C), then how do we compare the two fits?

If you wish to compare goodness of fit, then compare the chi-square value of each fit.

Subject: Re: Compare non-linear function fit parameters of two data sets
Posted by Russell[1] on Mon, 23 Nov 2015 20:06:00 GMT
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On Sunday, November 15, 2015 at 5:21:22 AM UTC-5, suruchi wrote:
> If we have two different sample datasets and we fit a non-linear function to these two datasets (for example an exponential function AB^x +C), then how do we compare the two fits?

As a general rule, chi^2 is probably what you want. But the problem can be a bit more subtle, if you're not careful. If you're fitting two different models to a bunch of data and trying to conclude which model is better, then chi2 might not be the whole story. If the models have different numbers of free parameters, then chi2 can be deceiving. Consider a case where you have a model of the form:

y(x) = a + b * x

and a second model:

z(x) = a + b*x + c*x2+d*x^3 + ... + h*x^6

then you naturally expect z(x) to be a better fit (and lower chi2) by virtue of having more "flexibility". Look at the various "information criteria":

https://en.wikipedia.org/wiki/Information_criterion

But even this isn't very clear, because the question of model selection is not entirely closed (at least that is my understanding).

-R