

# Re: Maximum likelihood estimator and multiple maxima

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- *From:* "Alejandro S. Jakubi" <jakubi@xxxxxxxxxx>
  - *Date:* Tue, 27 Dec 2005 23:11:43 EST
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> Maximum likelihood is NOT the same as minimum chi-squared.

I would ask you some further explanation/pointers why not. In the standard practice of this field it is assumed independent observations, each with gaussian distribution. Hence the likelihood is a product of gaussians and it becomes proportional to  $\exp(-\text{chi-square}/2)$ .

- > The likelihood function is always equivalent to the minimal
- > sufficient statistic; this does not make the location of
- > its maximum necessarily the best estimator.

Which estimators could I use instead?

- > are many situations where this occurs. But it does mean that
- > the data cannot distinguish between these points, and only the
- > prior (see Robert Dodier's response) can separate them.

I will have to look more closely at that, but it sounds to me that I would need to give prior probability distributions on the parameters of the fit. If so, probably I would be in trouble as the most that I could say about is that they are within a region. Hence I would prescribe a uniform distribution inside.

- > Even if careful calculation separates them, the data do not
- > treat the points as much different. In this case, it is still
- > the prior, and the loss function, which are the only real guides
- > you have as to which action to take. If you have widely separated
- > maxima with likelihood ratios differing by a factor of two, the
- > integrated areas may even reverse the situation. A risk analysis
- > is clearly needed, not just a likelihood calculation.

I am not familiar with the terms "loss function" and "risk analysis". Any pointer on these subjects would be welcomed.

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Re: Maximum likelihood estimator and multiple maxima

- **References:**

- ◆ **Re: Maximum likelihood estimator and multiple maxima**

- ◆ *From:* Herman Rubin

- Prev by Date: *cant figure out this problem in my textbook...*

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