

Re: Computational complexity of finding MLEs?

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- *From:* hrrubin@xxxxxxxxxxxxxxxxxxxxxx (Herman Rubin)
 - *Date:* 17 Nov 2005 10:32:42 -0500
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In article <1132193333.359929.12880@xxxxxxxxxxxxxxxxxxxxxxxxxxxxxx>, Yaroslav Bulatov <yaroslavvb@xxxxxxxxxx> wrote:
>But how do we know that we even need to compute derivatives of the
>log-likelihood function? For instance, we can estimate the mean
>parameter of the Normal distribution by just averaging the observations
>together. As opposed to logistic regression, where we may have to
>compute derivatives and iterate several times. Are we able to rule out
>the existence of a special purpose efficient algorithm (like for
>estimating mean of the Normal distribution) for cases where Newton-type
>methods are typically used?

This is a situation which occurs often in complexity. It is generally the case that there are special cases of highly reduced complexity. Rational exponents with small powers are easier to compute; for $A \cdot \exp(-b \cdot |x-c|^q)$, the situation becomes markedly worse for q not an integer, and worse for $q < 1$, and even worse for $q < .5$.

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This address is for information only. I do not claim that these views are those of the Statistics Department or of Purdue University.
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- *References:*
 - ◆ ***Computational complexity of finding MLEs?***
◇ *From:* Yaroslav Bulatov
 - ◆ ***Re: Computational complexity of finding MLEs?***
◇ *From:* Herman Rubin
 - ◆ ***Re: Computational complexity of finding MLEs?***
◇ *From:* Yaroslav Bulatov
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Re: Computational complexity of finding MLEs?

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