

Re: Matrix derivative

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Thanks to all of you.

I forget to mention that A is symmetric and positive semidefinite (if that's important here).

Thanks for the literature-hints but until now I didn't get the final idea to solve this.

By the way, the whole formula is

$\text{tr}(A * d/dA \log A)$

and I guess this has to evaluate to the identity.

Herman Rubin schrieb:

In article <1166789958.652578.169980@xx>, seppl <basti2@xxxxxxxxxxxxxxxx> wrote:

Hi all,

I'd like to know the derivative of

$\log A$ w.r.t A , where \log is the matrix logarithm and how to compute it.

Generally, one uses differentials. But $\log(A+dA)$ is not an easy expression otherwise.

To see this, consider $\log(I - X - dX)$, where X is small (all characteristic roots less than 1 in absolute value). This is $-\sum (X+dX)^n/n$. Now if we expand this, and

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just keep the first order terms in dX , we find the negative of the differential of the logarithm is

$$dX + (X*dX + dX*X)/2 + (X^2*dX + X*dX*X + dX*X^2)/3 + \dots$$

This does not simplify unless X and dX commute.

Furthermore I would like to know if there is a good online-available reference for matrix derivatives.

Thanks in advance.
Seppl

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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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