

KU Leuven Summer School
Bayesian Inference in Latent Variable Models
Conclusion

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Bayes theorem is simplicity personified!

- ▶ Start with a generative model. (No debate that you need this. Could be debate about form.)
- ▶ Joint distribution of all unobserved quantities given all observed quantities governs any inference you might want or need. **No debate.**
- ▶ Conceptually on auto-pilot.

Computing with Bayes theorem - simplicity lost?

- ▶ Which package?
- ▶ Augmented versus collapsed^s?
- ▶ Monitor numerical error.
- ▶ What to do when numerical error per unit wall-time is lousy???
- ▶ How to get around the folk-theorem?

Prior distribution - blessing or curse?

Admittedly, I've been very scattershot on this (for sake of illustration, say the prior is blah).

In fact, there are big literatures on:

- ▶ Formal elicitation of priors
- ▶ Weakly informative priors
- ▶ Unintended consequences of prior specifications
- ▶ Schemes for quantifying prior influence

Admittedly, there is angst!

Hints at blessing (1 of 2)

Prior as a device to link up the science and the math:

- ▶ Express that test sensitivity varies smoothly in time, while test specificity is static
- ▶ Express that infection fatality rate will vary less dramatically than infection rate across space, particularly after inclusion of covariates

Hints at blessing (2 of 2)

Think of prior as your (or the investigator's) forecast as to the state of the world.

With respect to your forecast:

- ▶ Your credible intervals have the right coverage
- ▶ Your point estimates are best possible

Okay, that's the end. You put up with me for two days, so
...

Thank you

Dank u wel

Merci beaucoup

Danke

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