

What do we mean by Bayesian data analysis?
What does WinBUGS actually do?
The Norwegian Computing center presents a course in:

Bayesian data analysis with applications within medicine

June, Tuesday 5th, 2007,
9.00-15.00 o'clock

The Norwegian Computing Center, Gaustadalléen 23, Blindern, Oslo

Kurs

Bayesian methods are becoming an increasingly popular alternative to frequentist approaches in medicine as well as other fields of research. The aim of this course is to introduce the concepts behind Bayesian data analysis. We also consider Markov chain Monte Carlo (MCMC) algorithms and how to do Bayesian inference. The WinBUGS software is an expert system for doing Bayesian analysis using MCMC methods. A series of examples will be demonstrated in WinBUGS. We will consider:

- The concept of Bayesian methodology, choice of prior
- Bayesian inference; point estimates, credibility intervals, hypothesis testing, prediction
- MCMC methods
- WinBUGS: how to implement a model and run it
- All illustrated with a series of examples within the field of medicine

The course is appropriate for everyone interested in Bayesian decision making, although the illustrations in the course will all be within the field of medicine. The course will be given in English by request.

For more information, see the back of this sheet, or <http://www.nr.no/kurs/>.

Registration deadline is May, the 25th, to Ingunn Fride Tvette (phone 22852685) or by email: kurs@nr.no. We give several courses, so please remember to include the courses name when registering.

Price (incl. lunch): kr 3000 (students and PhD students half price). We will send an invoice. Please remember to give a billing address when registering.

Contents

Introduction: overview of course 09.00 – 09.15

Bayesian analysis 09.15 – 12.00

(Break 10.30-10.45)

- Two approaches in statistics: Frequentist & Bayesian
- The Bayesian approach: Bayes theorem, various priors
- Bayesian inference: point estimate, credibility interval, hypothesis testing, prediction
- Model selection: Bayes factors, BIC, DIC
- Examples

Lunch 12.00 – 12.45

Bayesian computation with WinBUGS 12.45 – 15.00

(Break 13.45-14.00)

- MCMC methods: Gibbs sampling, MH
- Specifying models in WinBUGS
- Fitting models in WinBUGS: Implementation, running, output
- Short: convergence diagnostics
- Examples



Norsk Regnesentral (NR) er en privat, uavhengig stiftelse som utfører oppdragsforskning for bedrifter og det offentlige i det norske og internasjonale markedet. NR ble etablert i 1952 og har kontorer i Informatikkbygningen ved Universitetet i Oslo. NR er et av Europas største miljøer innen anvendt

statistikk. Det jobbes med svært mange forskjellige problemstillinger slik som estimering av torskebestanden, finansiell risiko, beskrivelse av geologien i petroleumsreservoarer og overvåking av klimaendringer. NR er også ledende i Norge innen utvalgte deler av informasjons- og kommunikasjons-

teknologi. Problemstillinger kan være å overvåke inntrengning i datasystemer, e-læring i skole og næringsliv, bruk av datateknologi i markedsanalyser samt anvendelser av multimedia på forskjellige plattformer. NRs visjon er forskningsresultater som brukes og synes.

Norsk Regnesentral
Norwegian Computing Center
Postboks 114, Blindern
NO-0314 Oslo, Norway