

Seminar über Statistik FS2008: Bayesian Statistics

- The Bayesian Paradigm
 - prior/likelihood/posterior distribution, predictions, likelihood principle
 - [GCSR03] Chapt. 2 + 3, [Rob07] Chapt. 1
- Inference and Decision Theory
 - loss and risk, actions and decisions, optimalities
 - [Rob07] Chapt. 2
- Prior Information
 - conjugate priors, non-informative priors, eliciting priors
 - [Rob07] Chapt. 1.5 + 3
- Nonparametric Bayes: The Dirichlet Process
 - [Sch95] Chapt. 6.1, [Fer73], [Set94]
- Asymptotics
 - Consistency, asymptotic normality and asymptotic efficiency of Bayes estimators
 - [Leh83] Chapt. 6.7, [GCSR03] Chapt. 4
- Model Selection
 - Bayes factor, Bayesian information criterion, model averaging
 - [Rob07] Chapt. 5.1 + 5.2 + 7.1 + 7.2 + 7.5
- Hierarchical and Empirical Bayes
 - [Rob07] Chapt. 10, [GCSR03] Chapt. 5
- Computational Aspects
 - Markov chain Monte Carlo, Gibbs sampling, Hastings-Metropolis algorithm
 - [Rob07] Chapt. 6.3, [GCSR03] Chapt. 11
- Axiomatic Treatment of Utility, Betting Systems
 - [Rob07] Chapt. 2.2, [BS94]

References

- [BS94] José M. Bernardo and Adrian F. M. Smith. *Bayesian Theory*. John Wiley & Sons, Chichester, 1994.
- [Fer73] Thomas S. Ferguson. A Bayesian Analysis of some Nonparametric Problems. *The Annals of Statistics*, 1(2):209-230, 1973.
- [GCSR03] Andrew Gelman, John B. Carlin, Hal S. Stern, and Donald B. Rubin. *Bayesian Data Analysis. Second Edition*. Texts in Statistical Science. Chapman & Hall/CRC, 2nd edition, 2003.
- [Leh83] E. L. Lehmann. *Theory of Point Estimation*. Wiley, N. Y., 1 edition, 1983.
- [Rob07] Christian P. Robert. *The Bayesian Choice*, volume 2. Springer Science and Business Media, LLC, 233 Spring Street, New York, NY 10013, USA, 233 Springer Street, 2nd edition, 2007.
- [Sch95] Mark J. Schervish. *Theory of Statistics*. Springer-Verlag, N. Y., 1995.
- [Set94] J. Sethuraman. A Constructive Definition of Dirichlet Priors. *Statistica Sinica*, 4:639-650, 1994.