Likelihood and Bayesian Asymptotics: Outline

1. definitions of convergence, asymptotic expansions, limiting normality, o_p, O_p notation; first order theory for likelihood inference
2. asymptotic normality of posterior distributions and likelihood functions
3. Edgeworth and Cornish-Fisher expansions; saddlepoint approximation by exponential tilting
4. p^* formula in exponential and transformation families
5. saddlepoint and Laplace methods for evaluating integrals
6. Laplace approximations in Bayesian inference
7. approximating exponential models and a general proof of p^*; integrating the p^* approximation
8. tail area approximations; Lugannani & Rice's formula, r^*, eliminating nuisance parameters
9. Bartlett correction of likelihood ratio statistics
10. frequentist coverage of Bayesian posterior intervals
11. non-regular problems; limit theory; power calculations;...

References

Selected papers will also be referred to as needed.

Barndorff-Nielsen, O.E. and Cox, D.R. (1990). *Asymptotic techniques for use in statistics.* Chapman and Hall, London.

Barndorff-Nielsen, O.E. and Cox, D.R. (1994). *Inference and asymptotics.* Chapman and Hall, London.

Cox, D.R. and Hinkley, D.V. (1974). *Theoretical Statistics.* Ch. 9. Chapman and Hall, London.

Ghosh, J.K. (1994). *Higher Order Asymptotics.* NSF-CBMS Regional Conference Series in Probability and Statistics, Volume 4. IMS, Hayward.

Hinkley, D.V., Reid, N. and Snell, E.J. (1990). *Statistical Theory and Modelling.* Chs. 1,10,12. Chapman and Hall, London.