STATS 730
Statistical inference
based on the likelihood

Course outline 2010

Lecturer:
Russell Millar, Room 211
Office hour: 1.30-2.30 Thurs. Drop-ins welcome at other times.

Assessment:
60% final exam + 20% midterm + 20% assignments, or 100% final exam, whichever is to your advantage.

Midterm:
60 mins duration, in class on Tuesday 4 May.

Course content:
Theory:
 Fundamental paradigms and principles of inference
 Properties of ML estimation, examples
 Efficient estimation, Cramer-Rao lower bound, information
 Consistency and asymptotic normality of ML estimators
 Likelihood ratio test
 Expected and observed information

Application:
 What you really need to know in practice
 Implementation of ML: Newton Raphson, Fisher’s method of scoring, EM algorithm
 Use of R and/or SAS for analysis and simulation
 Bootstrapping and prediction
 Hierarchical mixed models
 Box-Cox transformations, survival analysis, mixture models
 Exponential family models
 Quasi-likelihood and estimating equations
 Coping with nuisance parameters: conditional likelihood, marginal likelihood, profile likelihood
Reference texts


