STA 3000F: Theoretical Statistics
Fridays, 10.00 – 13.00, KP 113 Fall, 2013

Course description: The first half of this course will cover the following topics, as currently planned:

1. Statistical modelling and the likelihood function
2. Sufficiency, conditionality, and the likelihood principles
3. Brief overview of inference concepts: point estimation, hypothesis testing, significance testing, confidence intervals and regions, Bayesian inference, resampling (bootstrap) inference, decision theory
4. Likelihood asymptotics
5. Classical theory of testing, and false discovery rates
6. Topic(s) of your choice

Grading: The grade in the course will be based on regular homework (70%) and a final exam (30%).

Course web page(s): `http://www.utstat.utoronto.ca/reid/3000F13.html`.

Contact: Nancy Reid: SS 6002A, `reid@utstat.utoronto.ca`, 978-5046.
Office Hours: Wednesday 3 to 5, or by appointment.

Texts:
MSc level:
SM: *Statistical Models*, A. C. Davison (Cambridge University Press). Especially chapters 4 through 7 and 11, 12. Good reference work for graduate students, and used (by me) in Applied Statistics II.
Mathematical Statistics, K. Knight (Chapman & Hall). Good reference for point estimation, asymptotics.
Statistical Inference, G. Casella, R.L. Berger (Brooks/Cole). Good refresher for many topics.
All of Statistics, L. Wasserman (Springer): good coverage of false discovery rates, and other non-standard topics.
Essentials of Statistical Inference, G.A. Young and R.L. Smith (Cambridge University Press). Good coverage of bootstrap inference and higher order asymptotics.

More advanced:
CH: *Theoretical Statistics*, D.R. Cox, D.V. Hinkley (Chapman & Hall). Good coverage of topics and great discussions.
TPE: *Theory of Point Estimation*, E.L. Lehmann and G. Casella (Wiley). Classic.

Good discussion of measure theory in Ch.2; good on asymptotics for estimators in Ch.6.
Testing Statistical Hypotheses, E.L. Lehmann and J.P. Romano (Wiley). Classic. More rigorous and detailed than TPE, less broad coverage of topics.
Theory of Statistics, M.J. Schervish. (Springer). Bayesian through and through. Quite mathematical.
Principles of Statistical Inference: a neo-Fisherian approach, L. Pace, A. Salvan (World Scientific). Excellent discussion of likelihood inference.

Reading:
Principles of Statistical Inference, D.R. Cox (Cambridge University Press.
Principles of Applied Statistics, C. Donnelly and D.R. Cox (Cambridge University Press.