Course Outline STA2212H/453H1

from the private notebook
of
David Brenner

Jan7, 2018

contact info: **lectures:**

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ref./text:

Brenner, D. :
    FROM THE PRIVATE NOTE BOOK:
        Illustrated adventures in very (very) mathematical
          stochastic modelling & statistical inference, 2008-18

Fraser, D.A.S. :
    PROB & STATS: THRY & APPS (1976/2002/8)

Knight, K. :
    MATH STATS (2000)

Lehmann, E.L. :
    TESTING STAT HYPs (1957/86)   &   THRY of PT EST (1986)

Silvey, D.F. :
    STAT INF (1976)

– *understanding*: all contents subject to shuffling, merging, expansion & (really serious) modification

- the general statistical model & the structure of inference
  frequentist & bayesian
  confidence & testing

- confidence/credibility, optimality & likelihood
  both small sample & asymptotic

- sufficiency & the likelihood statistic
    - the rao-blackwell & lehman-scheffe theorems
    - the neymann factorization criterion (halmos & savage)
    - estimation theory: consistency, unbiasedness, minimum variance & relative efficiency

- exponential models & sufficiency in the finite dimensional case
    - cramer-rao theorem & cauchy-schwartz
    - the mathematics of moment generating functions

- the general linear model & orthogonal projection
    - correlation, regression & conditional expectation

- G-models, fiducial structure & invariance/symmetry
    - location-scale models

- hypothesis testing
    - testing means, variances: differences & ratios
    - neymann-pearson theory & the likelihood ratio test

- bayesian theory - frequentist theory
  a tale of two magisteria — uneasy alliance

grading (G) **:**

test (T) = 40 – Wed. Mar. 21 (10:00-12:00)
3assignments@20each $(A = A_1 + A_2 + A_3)$ = 60
final grade $G = T + A$