FALL 2017 - STAT 450 D100

STATISTICAL THEORY (3)

Class Number: 3557   Delivery Method: In Person

COURSE TIMES + LOCATION:

Mo 10:30 AM – 12:20 PM
AQ 5030, Burnaby

We 10:30 AM – 11:20 AM
WMC 3220, Burnaby

EXAM TIMES + LOCATION:

Dec 15, 2017
12:00 PM – 3:00 PM
AQ 5030, Burnaby

INSTRUCTOR:

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PREREQUISITES:

STAT 330.

Description

CALENDAR DESCRIPTION:

Distribution theory, methods for constructing tests, estimators, and confidence intervals with special attention to likelihood methods. Properties of the procedures including large sample theory. Quantitative.

COURSE DETAILS:

Additional note regarding the pre-requisite:

STAT 330 and its core concepts such as joint, marginal and conditional distributions; means, variances, covariances and correlations; distributions of functions of discrete bivariate random variables; and common families of distributions.

Outline:

Assuming the prerequisite background in chapters 1-4 of the text, the course will cover:

1. Review of distributions of functions of continuous bivariate random vectors (sections 2.1, 4.3 of text).
2. Estimation in finite samples: simple likelihood estimators; judging quality of estimators via MSE and unbiasedness and the use of sufficient statistics and the Rao-Blackwell theorem in this regard.
3. Testing in finite samples: Constructing likelihood ratio tests (LRTs); optimality of LRTs for point null and alternative hypotheses and the Neyman-Pearson lemma
4. Interval estimation in finite samples: Inverting test statistics; pivotal quantities
5. Convergence concepts for estimators: Central limit theorem; Weak Law of Large Numbers (convergence in probability); Slutsky's theorem; Delta-method for obtaining asymptotic distributions of functions of estimators
6. Large sample approximations to distributions of estimators: Normal approximations, bootstrap
7. Testing and interval estimation in large samples: LRTs, Wald and Score tests.

Grading

Assignments	15%
Midterm-October 18th	30%
Essay-Due November 23rd	10%
Final Exam	45%

NOTES:

Above grading is subject to change.

The term paper will be due by email by midnight November 23.   It will be a short expository paper on some aspect of statistical theory; the goal will be to describe the impact on practice of some piece of statistical theory without formulas.

Some of the assignments will involve computing in {\tt R}.

Materials

RECOMMENDED READING:

Recommended Textbook:

Statistical Inference (2nd ed.) by G. Casella and R. L. Berger. Publisher: Cengage
ISBN: 978-0-534-24312-8

DEPARTMENT UNDERGRADUATE NOTES:

Students with Disabilites:
Students requiring accommodations as a result of disability must contact the Centre for Students with Disabilities 778-782-3112 or csdo@sfu.ca

Tutor Requests:
Students looking for a Tutor should visit http://www.stat.sfu.ca/teaching/need-a-tutor-.html. We accept no responsibility for the consequences of any actions taken related to tutors.

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