STOCKHOLM UNIVERSITY DEPARTMENT OF STATISTICS ST-2012

STATISTICAL INFERENCE, ADVANCED LEVEL, ST703A, 7.5 ECTS CREDITS TEACHING PLAN

Home page

Home page of course is in http://gauss.stat.su.se/site/scheman/vtll/inferens.pdf and will be updated regularly. Additional information about the Department of Statistics can be found in http://www.statistics.su.se/.

Teacher (lectures and computer exercises)

Andriy Andreev, B:739, tel. 08-16 29 70, e-mail: andriy.andreev@stat.su.se.

Course expedition/Student office

The secretary's office is B:724 at the building B, floor 7. Office is open Mon-Tue $9^{\circ} - 11^{\circ}$, $13^{\circ} - 14^{\circ}$ (during the term) and Thurs $14^{\circ} - 16^{\circ}$ (during the term), tel. 08-16 29 95, e-mail: expedition@stat.su.se

Student counsellor

Patrik Zetterberg, B:780 at the building B, foor 7. Tel. 08-16 29 80, e-mail: patrik.zetterberg@stat.su.se

Lectures, theoretical and computer exercises

See the last page for the schedule

Computer exercises: Two compulsory computer laboratory exercises are planned in the course. The main goal of the exercises is to give students basic knowledge on how to use the Statistics Toolbox of Matlab. The toolbox provides a comprehensive set of techniques to assess and understand data, and offers a rich set of statistical plot types and interactive graphics. All toolbox functions are written in the open Matlab language, so that you can check the algorithms, modify the source code, and create your own custom functions. It is recommended that all the students participate in the computer exercises in the scheduled time. Those who

It is recommended that all the students participate in the computer exercises in the scheduled time. Those who miss a session will need to perform the planned exercises themselves and return a written report for that session.

Literature

Casella G. & Berger R. L. Statistical Inference. Second Edition, Duxbury Press (Thomson Learning Academic Resource Center), 2007.

Exam

Written exam: Friday, TBA Next written exam: TBA

Allowed aids in the exams

Table of common distributions; see the book by Casella & Berger, p. 620-627 (will be attached to the exam), calculator, dictionaries for translation and A5 page (both sides) written by you that does not contain solutions or proofs: should be handed in together with your solutions.

1

Schedule of what will be covered on which classes, including lists of problems

Week/Date	Time Place	Торіс	Reading	Assignment
W1 (): L1	9.00-12.00	Principles of data reduction. The suf- ficiency principle. Exponential family of distributions and factorization the- orem. Ancillary statistics.	6.1-6.2	6.1, 6.2, 6.3, 6.4, 6.6
W1 (): L2	9.00-12.00	Principles of data reduction (cont.) The formal likelihood paradigm and the equivariance principle.	6.3-6.4	6.9 (a, b), 6.14, 6.25, 6.40
W2 (): L3	9.00-12.00	Point Estimation: Bias, Risk, Consi- stency (repetition). Methods of finding estimators. Method of moments. Maxi- mum likelihood estimators.	7.1, 7.2.1-7.2.2	7.2, 7.3, 7.8, 7.10, 7.11
W3 (): L4	9.00-12.00	Methods of evaluating estimators. Cramer-Rao lower bound and Fisher information of the sample. Sufficiency and un-biased estimators. Rao-Blackwell theorem.	7.3 (7.3.4 is not included)	7.38, 7. 40, 7.41, 7.48 (a,b)
W4 (): L5	9.00-12.00	Hypotheses testing. Methods of finding tests. Likelihood ratio test.	8.2	8.1, 8.2, 8.3, 8.5 a), b), 8.8
W4 (): L6	9.00-12.00	Methods of evaluating tests. Error pro- babilities and power function. Size of the test, most powerful tests and Neyman-Pearson lemma. p-values.	8.3 (8.3.5 is not included)	8.12, 8.16, 8.18, 8.20, 8.37, 8.38 (a,b)
W5 (): L7	13.30-16.30	Interval estimation. Methods of finding interval estimators. Inverting a test statistics. Pivotal quantities.	9.2	9.1, 9.3, 9.5, 9.11
W5 (): L8	8.00-10.00	Methods of evaluating interval estima- tion. A uniformly most accurate confidence set.	9.3	9.12, 9.14, 9.25, 9.35
W6 (): L9	8.00-10.00	Methods of evaluating interval estima- tion. A uniformly most accurate confidence set (cont.).	9.3	9.12, 9.14, 9.25, 9.35 (cont.)
W7 (): L10	8.00-10.00	Asymptotic methods. Consistency and asymptotic efficiency of maximum like- lihood estimators.	10.1	10.1, 10.3, 10.15, 10.17 (R-code)
W8 (): L11	11.00-13.00	Large sample properties of likelihood ratio tests. Approximate maximum li- kelihood intervals.	10.3-10.4	10.19, 10.31, 10.32, 10.37
W9 (): L12	9.00-12.00			
W10 (): L13	9.00-12.00			
W11 (): L14	13.00-16.00			
W12 (): C1	9.00-12.00 B319	Large sample properties of point esti- mators.		
W13 (): C2	9.00-12.00 B319	Confidence intervals and hypothesis testing.		

In the following L, C stands for Lectures and theoretical exercises and Computer laborations, respectively.

