STAT 522 – 2018/19

Approximation
Theorems

Instructor: Jiahua Chen

Time/Location: Term 2 01/02/19- 02/11/19 MW 13:30-15:00

Room ESB 4192

A necessary ingredient of statistical inference is the knowledge of the distribution of random quantities such as functions of random variables, namely data. Yet precise analytical knowledge of their distributions is often infeasible. Luckily, when the amount of data is large, we can often approximate these distributions with satisfactory precision by easy-to-use distributions. Asymptotic theory is a research area devoted to find useful approximation theorems. This course will go over many asymptotic tools and illustrates their usefulness through research examples.

Prerequisite:

Stat 547 and Stat 460/560 or by the permission of the instructor.

Course material:

Will be posted in a website to be announced.

Required background:

Knowledge in mathematical analysis and probability theory.

Topics:

- Modes of convergence, stochastic orders.

- Results on asymptotic normality.

- Empirical distribution and quartiles.

- Consistency of the maximum likelihood estimation.

- Approximate theorems in finite mixture models.

- Approximate theorems in empirical likelihood.

Assessment:

  Students will be expected to work on up to 20 assignment problems plus a research report on a topic of their own choice.