Course on Resampling Techniques in Statistics and Data Science

Department of Mathematical Sciences, Aalborg University

Course Description

Motivation

Resampling techniques are a powerful tool in the hands of statisticians and data scientists. They provide a way to estimate the distribution of a statistic without making strong assumptions about the underlying data-generating process. This is particularly useful when the data is not normally distributed or when the sample size is small. Resampling techniques are widely used in a variety of applications, including hypothesis testing, confidence interval estimation, and model selection.

Contents

Day 1: Resampling under independence

- Jackknife, bootstrap and subsampling approaches
- Bias, variance, and distribution estimation
- Confidence intervals and hypothesis tests
- Accuracy of bootstrap
- Linear models and heterogeneity
- Nonparametric density and regression estimation

Day 2: Resampling under dependence

- Block bootstrap
- Model-based bootstrap
- Sieve bootstrap
- Periodogram bootstrap (brief exposition)
- Subsampling
- Non-stationarity and long memory

Instructors

- Prof. Z. Psaradakis, Birkbeck, University of London.
- Marian Vavra, National Bank of Slovakia

Prerequisites

Basic knowledge of time series and statistics.

ECTS Credits

The course offers 2 ECTS credit points, subject to approval from your supervisor and a diploma for participation will be given.

Logistics

Schedule

The course will be held on May 20th-21th, 2025.

Venue

The course will be held at AAU Innovate, Aalborg University, Aalborg, Denmark.

The building is located at Thomas Manns Vej 25, 9220 Aalborg East, Denmark.

Registration

Register by filling out this form.

Deadline for registration is November May 15th, 2025.

Fee

The course is free of charge for all participants thanks to the generous support of the Danish Data Science Academy (DDSA).

Costs associated with transportation and accommodation should be covered by the participants' home institutions.

Questions

For any questions regarding the course, please contact Charisios Grivas, cgrivas@math.aau.dk.

We look forward to welcoming you!