

Applied multivariate techniques

A Module of the course: Statistical Models

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Course schedule

Regular Time: 09:30-12:00 (except for THU 24/02 09:30-11:00)

- THU 13/01 Matrix decompositions and Dimensionality Reduction. (MKB: Appendix A, Chapter 8)
- THU 20/01 Homeworks/mini-seminars
Multidimensional Scaling, t-SNE (MKB: Chapter 14, van der Maaten & Hinton (2008) Visualizing High-Dimensional Data Using t-SNE, Journal of Machine Learning Research)
- THU 27/01 Homeworks/mini-seminars
Analysis, and Graph Drawing
Canonical Correlation Analysis and extensions (MKB: Chapter 10)
- WED 02/02 Homeworks/mini-seminars
Modern multiple testing approaches
- TUE 08/02 Homeworks/mini-seminars.
Split methods + post-selection inference
- THU 17/02 Homeworks/mini-seminars.
Stability Selection + Knockoff Methods
- THU 24/02 Homeworks/mini-seminars.
Summary and insight into further research directions

Notes

A reference for part of the course is certainly K. V. Mardia, J. T. Kent, & J. M. Bibby (1979) *Multivariate Analysis*. New York: Academic Press [MKB].

The rest of the lectures will be based on research articles and didactic material provided by the teacher.

Despite the use of personal computer - together with a statistical software such as R, Python or Matlab - during the the classes is not mandatory, it may become useful from time to time.

Teaching, Exams and Final Score

Structure of a prototypical lesson:

- 10 mins: quick exercise (contents of the previous lessons)

- 50 mins: mini-talk/seminar/tutorial by a group of students
- 10 mins: break
- 90 mins: theoretical contents and lab

The final score = 50% quick exercise/Homework + 25% group seminar 1 + 25% group seminar 2
(D means below 50%; C, B, A are equally spaced on the upper 50%)