Statistical Methods (SM)

(Introduction to the course)

N. Torelli, G. Di Credico, R. Macrì Demartino

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University of Trieste

General information

Instructors

- Nicola Torelli
- Gioia Di Credico
- Roberto Macrì Demartino (lab)

Schedule and Organization

Lectures (or labs) are on

- Monday (16.00-19.00): room 4_B - Bldg D;
  - except 20/10: room 4_C - Bldg D
- Thursday (12.00-13.00): room 4_C - Bldg D
- Thursday (14.00-16.00): room T_A - Bldg D;
  - except 25/9 and 16/10: room A - Bldg A
- Friday (15.00-17.00): room 3_A - Bldg D;
  - except 17/10 and 28/11: room 4_C - Bldg D

There will be no lecture on November 3rd.

Possible changes will be notified in advance.

Office hours

- Gioia di Credico - Office 2.19, Bldg D
  - Wednesday from 15.30 to 17.00
- Nicola Torelli - Office 2.10, Bldg D
  - Wednesday from 17.00 to 18.30
- Roberto Macrì Demartino - Office 2.13, Bldg D
  - Friday from 17.00 to 18.30

or via MS Teams (or other similar tools), on demand.

In that case, drop us an email at

- nicola.torelli@deams.units.it
- gioia.dicredico@deams.units.it
- roberto.macridemartino@deams.units.it

if possible some days beforehand.

Aim of the course

From the *syllabus*

> *The course focuses on fundamental elements of statistical inference, along with some principles and statistical techniques useful for the analysis of complex data.*

This will give you a deeper understanding of many tools used in AI and ML and more awareness on properties of methods used.

The central theme of the course will be **statistical modelling** of data, yet the focus will be more on *ideas* and *principles* rather than on details of the statistical methodology.

Mathematical contents will be limited to a healthy minimum.

Role of R software

The *learning by doing* philosophy will be embodied by the constant usage of the R software throughout the course.

R will be used in two ways:

- In the R laboratory sessions
- In the *R lab* slides used in classes, where R will be used to demonstrate some of the theoretical concepts *on the fly*.

Textbook and recommended readings

- The reference textbook is
  - A. Agresti, M. Katery: **Foundations of Statistics for Data Scientists: With R and Python**, Chapman & Hall, 2021 (Main Text)
- Other texts of interest are
  - S.N. Wood: **Core Statistics**, Cambridge University Press, 2016 (it can be freely downloaded from the author webpage: here)
  - James, Gareth, et al.: **An introduction to statistical learning: with applications in R**. New York: Springer, 2013

Teaching material

The slides of the lectures, the text of the homework plus any announcement related to the course organization will be posted on the UniTS Moodle repository.

Moodle password: SM25

If you are not automatically enrolled on the Team, you can access it using the code: 2iqm9by

Information on the final exam

Final evaluation is based on

- **Homework** (10%) Homework will be assigned each couple of weeks to groups of about three/four students. The groups will be **formed by randomly chosen students, possibly changing across occasion.** Homework have strict deadlines.
- **Intermediate tests** (45%) Intermediate tests will be held in two occasions during the course
- **Final project** (45%) Final project will be assigned well before the end of the course and will be presented by the students right after the end of the lectures. Here the groups will be formed by three/four students, freely chosen. Each student has to take part at the presentation (it should take about 30 minutes).

Those students who do not complete all the homework *or* do not participate to the tests *or* do not present the final project will have to present a final project and to pass oral exam. Oral exams will be scheduled according to the rules for the Deparment.