Introduction

Sandro Cumani

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Politecnico di Torino

Course organization

The course will be held by

- Sandro Cumani (sandro.cumani@polito.it)
- Salvatore Sarni (salvatore.sarni@polito.it)

The course consists of 3 hours per week of lessons and 1,5 hours per week of laboratory

- Thursday, 14:30 – 17:30, Lessons — Sandro Cumani
- Friday, 11:30 – 13:00, Laboratory (in class, bring your own laptop) — Sandro Cumani, Salvatore Sarni

For any question, you can write e-mails to sandro.cumani@polito.it
The subject of the email MUST begin with the course code 01URTOV

Course organization

The lessons will mainly cover theoretical aspects of Machine Learning and Pattern Recognition

The laboratories will allow implementing techniques presented during lessons

Attendance to laboratories is strongly encouraged. The laboratories will often introduce concepts that may not have been presented during classes (and are part of the oral examination)

Course organization

The exam will consist of two parts:

- A project (18 points)
- An oral examination (12 points)

Course organization

The project will require solving a classification problem on a specific dataset.

You will be able to choose among a small set of tasks (the tasks will be presented in the following weeks)

The project may be done in groups (at most 2 people)

You should analyze which, among the methods that will be presented during classes, are suited to solve the problem

You should solve the problem using different approaches, and provide a critical analysis of the results obtained by the different techniques

You are free to experiment with methods that extend what we will see during classes

Course organization

You are required to submit a report, providing

- A description of the problem and of the dataset, together with an analysis of the dataset features
- An analysis of different methods that can solve the problem
- A comparison of the effectiveness of the different methods
- A critical analysis of the results
- The code that you used to implement the different algorithms (Python)

Even if some techniques do not work well, you are encouraged to add them, with a justification for their bad performance

Course organization

Since this course presents the basis of Machine Learning, avoid using ML libraries or ML toolboxes for the project (using toolboxes will result in lower marks — one of the goal of the course is that you learn how to implement the approaches)

The laboratories are already organized as to allow you to implement many of the techniques that we will discuss

You can, of course, re-use the code developed during the labs (including snippets provided by us)

If you are in doubt whether you can use some library or not, ASK

Course organization

If you want to participate to an exam session, you have to submit the report by the official exam date

Oral examinations will start 7 – 10 days after, the timetable will be provided through the teaching portal

The report must be submitted through the teaching portal, section “Work Submission” (Elaborati)

The format should be a `.zip` file, containing

- The report in pdf format
- The source code (python source files, no jupyter notebook or similars)

The file name should be `<student id>_<exam-date>.zip`

Course organization

For group projects, both authors should upload their own `.zip` file

The report must contain the names of both authors

Course organization

You can keep the same report for different oral sessions

The report mark will be disclosed during the oral exam

If you fail or withdraw from an oral session, you can also upload a new report if you wish to improve the report mark:

- If you withdraw before getting the report mark, you can re-submit the report on the same task
- After the report mark has been disclosed (to you or to your team mate), if you want to improve the mark you have to submit a report on a different task

The oral examination will include a discussion of the project, and questions that can cover the whole program

Course organization

In the teaching portal you will find the text of the laboratories and the slides used during classes. These will come in two versions:

- Slides projected during the classes
- Print-friendly version with less color

Reference books:

[1] Christopher M. Bishop. 2006. Pattern Recognition and Machine Learning (Information Science and Statistics). Springer-Verlag, Berlin, Heidelberg.

[2] Kevin P. Murphy. 2012. Machine Learning: A Probabilistic Perspective. The MIT Press.