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, 13:00 – 14:30, 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 may be part of the written examination)

Course organization

The exam will consist of two parts:

- A witten examination (20 points, minimum mark to pass the exam 10/20)
- A project (10 points, minimum mark to pass the exam 5/10)

Course organization

The written examination will cover the machine learning theory presented during lectures (and partially during laboratories)

It will consist of two or three open questions

Duration: 2 hours

Bring your own sheet of paper (excercise paper — fogli protocollo)

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

For the project 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

The project and the written exam can be taken on different sessions

The mark will be kept until the february 2024 session

To take either the written or the project part of the exam in a session you still HAVE TO REGISTER for that session. If you don't submit both the written exam and the project for that session, a "rejected" mark will be registered for the session, and the mark will be kept for the next sessions

If you have taken only one part of the exam you can reject the corresponding mark by sending an e-mail or simply by taking again that part of the exam in a following session

The exam will be registered as passed on the first session in which you will have a sufficient mark for both parts — in this case, if you want to reject the mark, you have to send an email at most 3 DAYS AFTER the results have been disclosed, otherwise the exam will be registered.

Course organization

Written exam: it will follow the standard rules, the date and classroom will be provided through the usual channels (portal)

Project deadline: you have to submit the report by the corresponding written exam date

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

Group projects: both authors should upload their own `.zip` file

The report must contain the names of both authors

Each author can submit the report on a different session if he chooses to do so — however, the first submission will be considered for the mark (i.e. it's not possible to improve the mark given to your colleague for group works)

Each author can independently reject the report mark, following the rules for rejected marks (next slides) — in this case, the student who rejects the report must do an individual work for the next session

Course organization

Rules for insufficient or rejected project marks:

- If you submit a report but withdraw before getting the report mark (by sending an email after submitting but before the disclosure of the report marks), you can re-submit the report on the same task
- After the report mark has been disclosed (either to you or to your team mate), if you want to (or must, if the report mark was insufficient) improve the mark you have to submit a report on a different task

Exam rules are valid until february 2024. If you don't pass the exam by that session, neither the written mark nor the project mark will be kept, and you will be required to do a new project on the topics that will be assigned next year.

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.