

The background of the slide features a large, faint, circular watermark of the University of Turin seal. The seal contains the text 'SIT ASS STUDII' around the top and 'MCCXXII' at the bottom, with a central emblem depicting two figures.

Deep Learning

LM Computer Science, Data Science, Cybersecurity
2nd semester - 6 CFU

Nicolò Navarin & Alessandro Sperduti

Course Logistics

- Classes: Tuesday 12:30 – 14:30, Wednesday 12:30 - 14:30
- Consultancy hours:
 - Nicolò Navarin: Friday afternoon after 16.30
 - Alessandro Sperduti: Friday afternoon after 16.30
- **Exam**:
 - Homeworks (**necessary condition to take the exam**)
 - 6 assignments during the semester (Jupiter notebooks)
 - **Written exam** at the end of the semester
- Resources (available online):
 - **Deep Learning Book** (course book)
 - **Mathematics for Machine Learning** (math concepts)
 - **Mitchell** (supplementary machine learning book)
 - **Bishop** (supplementary machine learning book)
 - Other resources on **Moodle**: slides, lecture notes, cheat sheets

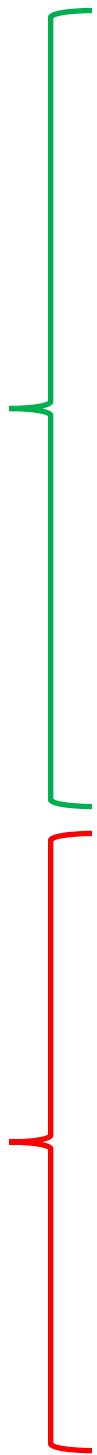
Homeworks

- HWs can be submitted:
 - During the course and
 - Before each exam
- Each HW will be graded:
 - Score < 80 -> HW failed
 - If failed, it must be resubmitted
- Homeworks will **not** influence the final exam score
- **You should have passed all the homeworks in order to take the exam**

Lecture Modalities

- Lectures will be in the **Dual** modality
 - In presence (1C150) (strongly suggested)
 - live on Zoom
 - Recordings will be available on Moodle **for a limited time after the lecture**
- Keep an eye on **Moodle** for updates!

Course Outline

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- Introduction to Deep Learning/Basic concepts;
 - Deep Feedforward Networks; HW1
 - Regularization for Deep Learning;
 - Optimization for training Deep Models; HW2
 - Convolutional Neural Networks; HW3
 - Graph Convolutional Networks
 - Recurrent Neural Networks for sequence modelling; HW4
 - Recursive Neural Networks for Trees and Graphs
 - Autoencoders; HW5
 - Deep Generative Models; HW6
 - TensorFlow (homeworks).

What this course is NOT

- Easy 6 credits to add to your study plan
 - Deep learning requires many different skills: Linear Algebra, vector Calculus, Probability, Programming
 - We will briefly review the basics you need
 - you may have to put some additional effort in parts of the course for which you lack (or forgot) some basic concepts
- Applied Deep Learning
 - We will cover the principles of deep learning
- Machine learning
 - This course assumes familiarity with machine learning concepts
 - Again, we will have a class covering the basic concepts
 - And again, some additional effort may be required if you didn't follow a ML course

Google Cloud Platform Credits

- We [applied] for support from Google
 - Credits to run programs on the Google cloud
 - Powerful machines with GPUs to run deep learning models
 - Possible to connect the machines to Google Colab