



Seminar: Advanced Topics in Machine Learning and Data Science

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Introduction

Goal of this Seminar Course

- Learn about advanced topics in machine learning.
- Share what you have learnt by giving a scientific presentation.

Today

- Present the 20 papers.
- Algorithm for assigning the papers.
- Course organization and grading.

Course Organization

- Lectures on Wednesdays 16:00 – 18:00 @ LFW E13
- Lecture days: 16/03 – 25/05 (no lecture on Easter week 20/04).
- You are expected to attend all lectures and present in one.
- First presentation will be in two weeks.
- No lecture on **09/03**.
- I have reserved two 30-min slots to discuss with each one of you before your presentation:
 - Wednesdays: One week before the presentation.
 - Mondays: Two days before the presentation.

Grading

- Your grade will be determined based on your talk, as well as participation in the discussion.
- Criteria:
 - ① **Structure:** how well is your talk organized?
 - ② **Understandability:** how understandable is your oral presentation and slide design?
 - ③ **Completeness:** how well do you provide right background, and manage to focus on what is important and relevant?
 - ④ **Engagement:** how engaged are you in class and in the talk preparation?
 - ⑤ **Independence:** how independent are you in preparing the presentation, and in reflecting on the paper?
 - ⑥ **Class participation:** Questions during the lectures?

Presentation details

- Use electronic slides (ppt, pdf, ...).
- Talk length: **30 min** + 15 min discussion.
- The talk should provide sufficient background to be understandable to someone who has taken an ML class.
- You should present:
 - ① Main Contributions.
 - ② Results.
 - ③ Critic.

Meta Presentation

- **Introduction:** Motivation.
- **Problem statement:** Notation and main contribution.
- **Technical contribution:** details of the contribution.
- **Experiments** (if applicable).
- **Your take:** Why did you like the paper? (or not) what are you missing? What's wrong? ...

Paper Assignment

- You have a list of papers in:
<https://github.com/fernandoperezc/Advanced-Topics-in-Machine-Learning-and-Data-Science>.
- Please select at least five papers in this survey:
<https://forms.gle/rt3n4TAjsQ94nLbS7>.
- You will also need to select at least 5 prefer papers.
- I will try to maximize your preferred paper ranking, but will penalized students with less than 5 papers selected.
- I will finalize the assignment on Sunday March 6th.
- I will send you an invite to the lecture and an invite to two 30-mins meetings prior to the presentation.

Topics

- Six papers on Transformers and visual transformers.
- Four papers on Unsupervised Deep Learning.
- Six papers on Causality, Robustness and Interpretability.
- Two papers on Knowledge distillation.
- One paper in measuring quality of generated text.
- One paper in adversarial training.