

Autonomous and Adaptive Systems

Introduction to the Course/Administrivia

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Topics of the Module

- ▶ Machines that learn through experience: Reinforcement Learning (including Deep Reinforcement Learning)
- ▶ Machines that create: Generative Deep Learning
- ▶ Algorithmic Game Theory and Multi-agent Learning
- ▶ Bio-inspired adaptive systems
- ▶ Autonomous robots and driverless cars
- ▶ Ethical and philosophical implications of AI
- ▶ What's next: going beyond human-level intelligence, RL and foundational models, self-awareness and controllability.

Administrivia: Organisation of the Module

- ▶ We will have a variety of activities, including practical sessions, discussion of research papers with students' presentations, etc.
- ▶ Strong focus on the state-of-the-art (and what's next): we will read papers from leading AI/ML conferences (but also classics from the ML field), try software, etc.
- ▶ I will suggest papers to read before lectures, which will discuss together.
- ▶ The participation to these activities contributes to the final mark as discussed above.

Administrivia: Assessment

- ▶ The assessment will be based on an oral exam (90%) and class participation (10%).
- ▶ 6 oral exam sessions that will be announced on the course webpage and on the institutional website.
- ▶ The credit for the class participation is only valid during the current academic year. It cannot be transferred to the following one.

Administrivia: Assessment

- ▶ 6 exams per year.
- ▶ The exam will be structured as follows:
 - ▶ Discussion of a compulsory mini-project with presentation (max 3 slides + slide for the title);
 - ▶ A working demo is welcome (if possible/appropriate).
 - ▶ Questions about the topics covered during the module.

Administrivia: Assessment

- ▶ The title and type of mini-project does not need to be approved in advance.
- ▶ An up to 6-page short report (paper-style) about the project has to be submitted in advance, in any case before the exam registration deadline.
- ▶ You need to submit the code together with the report.
- ▶ Please submit the report by email.
 - ▶ You should not submit zip files but a link to a repository (cloud service, GitHub, etc).

Administrivia: Project

- ▶ Indications about potential projects will be made during the course.
 - ▶ Ideal project: replication of experiments presented in a paper or other state-of-the-art results (and, why not, improving over it).
 - ▶ Another ideal project: try to tackle a problem that has not been studied before.
 - ▶ Yet another ideal project: comparison of algorithms, sensitivity analysis, etc.
 - ▶ Many material online: **reusing/repackaging code is not considered a valid project.**
- ▶ I will provide clear indications about what constitute an original contribution. This will become clear after covering the relevant topics in the module.

Administrivia: Plagiarism

- ▶ The report/code will be checked for plagiarism.
- ▶ You should not use any code that you find online.
 - ▶ In case you use any code (even a couple of lines), this should be stated.
 - ▶ The fact you re-used code will be taken into consideration in the final assessment of the project.
 - ▶ The core part of the project in any case must be original, you cannot just submit a modified version of a project found in GitHub for example.
- ▶ I will follow the procedures of the University in case of plagiarism cases.

Administrivia: Format of the Report

- ▶ The report has to be written in English.
- ▶ The report must be submitted using the NeurIPS LaTeX style that can be found at this address:

<https://nips.cc/Conferences/2022/PaperInformation/StyleFiles>