

CS-E407522 - Special Course in Machine Learning, Data Science and Artificial Intelligence D: Introduction to Geometric Deep Learning, Lectures, 24.10.2024-13.2.2025

This course space end date is set to 13.02.2025

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Syllabus

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Department of Computer Science

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CS-E407522 - Special Course in Machine Learning, Data Science and Artificial Intelligence D: Introduction to Geometric Deep Learning, Lectures, 24.10.2024-13.2.2025

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Sections

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Evaluation

Course

Grades

Course feedback

Evaluation

Workload

This particular course offering is organized as a seminar on Geometric Deep Learning Models. The first 5 weeks consist of introductory lectures by the instructors on graph neural networks, equivariant networks, and differential geometry. The lectures are followed by a homework assignment in the form of pre-coded Jupyter notebooks and the corresponding solution session. The remaining sessions consist of paper presentations by the students. During the first two weeks of the course, the students form pairs and choose a paper for their presentation from a suggested list by ranking several options of interest. The papers are presented according to a predefined schedule created after paper ranking. Each presentation lasts 20 minutes, followed by 10 minutes of questions and 15 minutes of discussion. All participants are expected to read papers and write a short summary before the corresponding sessions for fruitful and insightful discussions during the sessions.

Assessment Methods and Criteria

Evaluation will be based on the following components:

Participation in sessions: In order to pass the course a student is expected to attend at least 12 out of 14 paper presentation. Participation in lectures is strongly recommended. Participation in solution sessions is strongly recommended and each student is expected to present one of the homework exercises during the course.

Notebook exercises: 30% of the total points are rewarded for homework exercises in notebooks, with 10% allocated to each of the three topics: graph neural networks, equivariance, and differential geometry. The notebooks consist of small pieces of code to complete and some theoretical questions to answer. The notebooks with the detailed instructions and deadlines will be accessible and returned through <https://jupyter.cs.aalto.fi/>.

Paper presentation and writing assignments: 70% of the total points are rewarded for paper seminars, which includes 40% for the presentation by a student (done in pairs) of one paper and 30% for writing assignments for the rest of the papers discussed in the course. In particular, the presentations will be evaluated on the clarity and accessibility of the presentation, the understanding of the scientific content, and the ability to answer questions. More detailed instructions on the evaluation of the presentations are available in the pdf file below.

The writing assignments are expected to be concise, up to one-page summaries for each presented paper. These summaries will be graded based on three criteria: clarity of the summary, scientific inquiry about the research, and insightful commentary that involves the students own reflections or opinions. The writing assignments are returned through MyCourses. More detailed instructions on the evaluation of the writing assignments are available in the pdf file below.

Acknowledgement: We thank the creators of Seminar on LLMs course for the presentation and writing assignment guidelines.

Presentation guidelines

PDF

Writing assignment guidelines

PDF

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Course schedule



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Lectures



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