

Geometric Deep Learning

An introductory course for PhD students in applied data sciences @Unibo

About the course

Instructor

Prof. Emanuele Rodolà

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***N.B.:** Please send an email to the instructor for registration. Lecture links and teaching material will be made available via email to the registered attendees.*

Duration: 10 hours (4 lectures, 2.5h each)

Schedule

- Dec 02nd (wed), 14:00-16:30
- Dec 04th (fri), 14:00-16:30
- Dec 08th (tue), 14:00-16:30
- Dec 11th (fri), 14:00-16:30

Location

Online via Google Meet. The link will be provided via email.

Teaching material

Slides and teaching material are in English and will be made available via Dropbox links.

Evaluation

The final assessment consists of a short report. Details will be given by the end of the course.

Overview

The course will cover the mathematical and computational foundations of geometric deep learning, going all the way from the basics to more recent advances in the vision, geometry, pattern recognition and learning communities. The final goal is to provide a broad understanding of this topic, and give the tools to analyze progress in this thriving area and possibly contribute to its advancement.

A tentative syllabus (subject to adjustment) is as follows:

- Background: linear algebra, discrete differential geometry, spectral graph analysis
- Generalized convolutions (spatial, spectral, operator-based)
- Popular pipelines and end-to-end geometric deep learning
- Generative models (graphs, mesh AE, implicit representations)
- Adversarial learning (attack, defense)
- Applications