Computational Optimal Transport

a.a. 2023/2024

Instructors:	Stefano Gualandi Marco Veneroni	**Office hours:**	Friday, 17:00–18:00
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Course Pages:

1. https://github.com/mathcoding/CompOT

GENERAL INFORMATION

Academic Honesty:	Lack of knowledge of the academic honesty policy is not a reasonable explanation for a violation.
Objectives:	This course is for Ph.D. students.
Prerequisites:	An undergraduate-level understanding of linear algebra, algorithms, programming, and functional analysis.
Class Policy:	Regular attendance is essential and expected.
Office Hours:	After class, or by appointment, or post your questions during and after the classes.
Grading Policy:	Project content and oral presentation.

COURSE OUTLINE

The outline is a general plan for the course, and it will be update depending on the material used during the lectures and lab sessions.

☞ **An introduction to Optimal Transport:**

Ambrosio, Bruè, Semola. **Lectures on Optimal Transport**, *Springer Nature Switzerland, 2021.*

Lecture 1: Preliminary notions and the Monge problem

Lecture 2: The Kantorovich problem

Lecture 8: The metric side of optimal transport

Lecture 3: The Kantorovich-Rubinstein duality

Lecture 5: Existence of optimal maps and applications

☞ **Computational Optimal Transport**

Gabriel Peyré and Marco Cuturi. **Computational Optimal Transport**, *https://arxiv.org/abs/1803.00567*.

Lab Session 1: Algorithmic Foundations (Network Simplex and Auction algorithm)

Lab Session 2: Entropic Regularization of Optimal Transport (Sinkhorn's algorithm)

Lab Session 3: Wasserstein Barycenters

Project presentations by students

TENTATIVE SCHEDULE

Time: 11:00-13:00, Room: Meeting Room - Floor C. Lectures schedule:

1. Thursday, May 30: Lecture
2. Monday, June 3: Lecture
3. Wednesday, June 5: Lab Session (9.15-12.15)
4. Thursday, June 6: Lecture
5. Monday, June 10: Lecture
6. Wednesday, June 12: Lab Session (9.15-12.15)
7. Friday, June 14: Lecture
8. Wednesday, June 26: Lab Session (9.15-12.15)