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)