The Metric Method and its Algorithmic Applications
Spring Semester 2021/2022

Overview:
The metric method is a powerful tool that has been used extensively in the last two decades in the design and analysis of algorithms. This course will survey some of the basic techniques in the metric approach, as well as its applications to various topics such as: clustering and graph cuts, balanced graph partitioning, network routing, and online algorithms.

Topics:
1. Low distortion embeddings
2. Approximate min multicut and max multicommodity flow
3. Region growing and spreading metrics
4. Approximating metrics by tree metrics
5. Oblivious routing and approximating cuts by trees
6. Metrics of negative type, random projections and measure concentration.

Prerequisites:
- Algorithms 1 (234247).
- Computability Theory (236343).
- A course in probability.
- Highly recommended: Algorithms 2 (236359) or Approximation Algorithms (236521).

Time:
Lecture: Monday 15:30-17:30 (Roy Schwartz)

Tutorial: Monday 13:30-14:30 (Dor Katzelnick)

Grading Policy:
By Homework and (possibly) a project.