

Advanced Topics in Algorithms L (236620):
The Metric Method and its Algorithmic Applications

Spring Semester 2018

Description:

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: cut problems in graphs, graph partitioning, network routing, and online algorithms.

Topics that will be covered include: low distortion embeddings, approximate min cut max flow with multiple commodities, region growing and spreading metrics, embedding into trees, oblivious routing and cut approximation, metrics of negative type, and random projections. Additionally, an emphasis will be given on the presentation of related open questions.

Prerequisites:

Algorithms 1 (234247), Computability Theory (236343) and a course in probability.

An advanced course in algorithms, e.g., Algorithms 2 (236359) or Approximation Algorithms (236521), is preferable but not mandatory.

Course Staff:

Roy Schwartz	Lecturer
Yaron Fairstein	Homework Checker

Grading:

The final grade will be determined by homework assignments.

There will be around 2-3 assignments during the semester, individual submission (not in pairs).