Words
and
Automata
Research
Group

matematica e informatica @ unipa

UNIVERSITÀ
DEGLI STUDI
DI PALERMO

Seminar Announcement

On Edit Distance Oracles and Planar Distance Oracles

Panagiotis Charalampopoulos (Birkbeck, University of London)

Monday November 28th, 2022, 10:30 a.m.

Room 7, Via Archirafi 34, 90123 Palermo

In this talk, I will discuss two related data structure problems: edit distance oracles and planar distance oracles. In the first problem, the goal is to pre-process two strings S and T of total length n into a data structure that can quickly report the edit distance between any substring of S and any substring of T. I will describe a data structure with polylogarithmic query time, and almost quadratic construction time and space usage. This is conditionally optimal up to subpolynomial factors; note that just computing the edit distance between S and T cannot be done in strongly subquadratic time unless the Strong Exponential Time Hypothesis fails. In the second problem, the goal is to preprocess a directed weighted planar graph into a data structure that can quickly report the distance between any two vertices. Using the concept of Voronoi diagrams, dramatic progress has been made on planar distance oracles in the past few years. I will describe an oracle of almost linear size that answers queries in polylogarithmic time. However, the time required to construct this oracle is roughly $O(n^{1.5})$, which is not known to be optimal. Most of the underlying techniques were originally developed for planar distance oracles and then specialised for edit distance oracles. The structure of the edit distance graph allows for a simpler exposition of the involved ideas and is further exploited to obtain a faster construction time.

The talk will be based on joint work with Paweł Gawrychowski, Shay Mozes, and Oren Weimann.

All interested people, in particular students, are invited to participate

For further information:

Gabriele Fici

T 091 238 91130

gabriele.fici@unipa.it