Seminar on Combinatorial Computing
September 13, Wednesday, 6:30 p.m.
Room 6417, Graduate Center
365 Fifth Avenue, New York

Greedy embeddings of planar triangulations

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Abstract

A path $v_1, v_2, \cdots, v_m$ in a planar drawing of a graph $G(V, E)$ is said to be *distance decreasing* if $d(v_i, v_m) < d(v_{i-1}, v_m)$ for every i. The drawing is said to be **greedy** if a distance decreasing path exists for every pair of distinct vertices $(s, t) \in V \times V$.

It was conjectured by Papadimitriou and Ratajczak that a greedy drawing exists for every 3-connected planar graph. We settle this conjecture in the affirmative for the case of triangulations.

A partitioning of the edges of a triangulation G into 3 trees, called the *realizer* of G, was first developed by Walter Schnyder, who also gave a drawing algorithm based on this notion. We generalize Schnyder's algorithm to obtain a whole class of drawings of any given triangulation G. We show, using the Knaster, Kuratowski, Mazurkiewicz Theorem, that some drawing of G belonging to this class is greedy.

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http://www.math.nyu.edu/p̃ach/public_html/combinatorics_seminar.html