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MADALGO seminar by Alexander Wolff, Eindhoven University of Technology

Geometric Networks - Construction, Analysis and Visualization

Geometric Networks are graphs whose nodes correspond to points in the plane. Such networks appear in many applications, from traffic networks via VLSI chip layout to sensor networks. The construction, analysis and visualization of geometric networks lead to interesting problems. Some highlights: for future cities we investigate how to reach the closest Internet cafe using a network of conveyor belts. We show that it is hard to draw subway maps - and how to draw them anyways (with acceptable computational effort). We devise algorithms that compute maximum (or provably large) matchings in some graph classes in near-linear time. Finally, we discuss how to continuously simplify polygonal curves. This has applications in generalizing roads or rivers on interactive maps.