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MADALGO seminar by Peyman Afshani, Aarhus University

Optimal Deterministic Shallow Cuttings for 3D Dominance Ranges

Abstract:

We present the first efficient deterministic algorithms that given a set of n three-dimensional points, they construct optimal size (single and multiple) shallow cuttings for orthogonal dominance ranges. In particular, we show how to construct a single shallow cutting in O(n log n) worst case time, using O(n) space. We also show how to construct in the same complexity, a logarithmic number of shallow cuttings. Only polynomial guarantees were previously achieved for the deterministic construction of shallow cuttings, even in three dimensions.

We will also discuss a few interesting questions left open by this work.