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MADALGO seminar by Morten Revsbæk, Aarhus University

I/O-Efficient Computation of Water Flow Across a Terrain

Abstract:

We consider rain falling at a uniform rate onto a terrain *T* represented as a TIN. Over time, water collects in the basins of *T*, forming lakes that spill into adjacent basins. Our goal is to compute for each terrain vertex, the time this vertex is covered by water.

We present an I/O-efficient algorithm that solves this problem using $O(sort(X)\log(X/M) + sort(N))$ I/Os, where *N* is the number of terrain vertices and *X* is the number of pits of the terrain.

Our algorithm assumes that the volumes and watersheds of the basins of *T* have been precomputed using existing methods.

Joint work with: Lars Arge and Norbert Zeh