



Semester- /Bachelor- /Master Thesis

Distributed Random Walks

To obtain a random walk in a graph one usually picks a starting point and selects a neighbor of it at random. Then one moves to this neighbor and selects a neighbor of this point at random and so on. The random sequence of points selected this way is a random walk on the graph. Random walks have various applications such as sampling random points from a graph or computing random spanning trees. Furthermore they can be used to estimate properties (like the mixing time) of a graph and in the case of directed graphs there are connections to PageRank.

We are interested in computing random walks in a distributed way and to which extend the power of having many processors helps computing it faster: one can compute a random walk of length l in less than l time. This is surprising since it seems at first sight that random walks can not be parallelized.

In this thesis one will consider different models of distributed computation and design and analyze algorithms for those. It is possible but not required to simulate the algorithms on a computer.

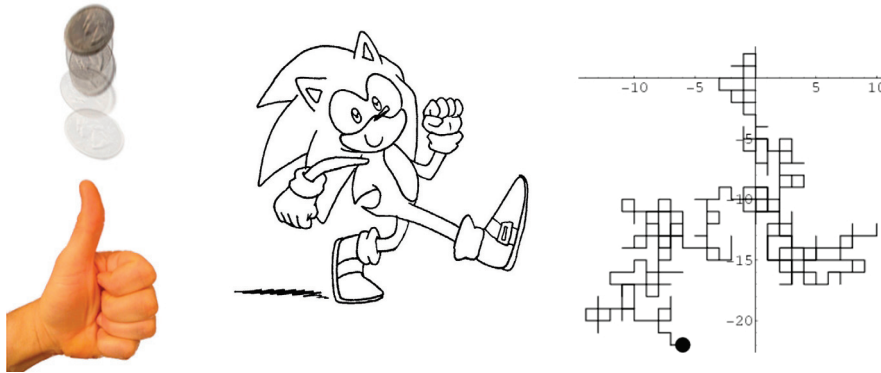


Figure 1: Random walk on a grid-graph.

Interested? Come to our office for coffee and a small chat or contact us by email / phone.

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