

Oberseminar Theoretische Informatik
Wintersemester 2006/07

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Deterministic Random Walks

Mo, 23.10.2006 um 14 Uhr (c.t.) im SR 125 (Carl-Zeiß-Str. 3, 1. Stock).

Jim Propp's rotor router model is a deterministic analogue of a random walk on a graph. Instead of distributing chips randomly, each vertex serves its neighbors in a fixed order. We analyze the difference between Propp machine and random walk on the infinite two-dimensional grid. It is known that, independent of the starting configuration, at each time, the number of chips on each vertex deviates from the expected number of chips in the random walk model by at most a constant. We show that this constant is approximately 7.8, if all vertices serve their neighbors in clockwise or counterclockwise order and 7.3 otherwise. This result in particular shows that the order in which the neighbors are served makes a difference. Our analysis also reveals a number of unexpected properties of these Propp machines.

Internetseite der Veranstaltung:

<http://theinf1.informatik.uni-jena.de/teaching/ws0607/oberseminar-ws0607>