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Title: Deterministic Random Walks for Rapidly Mixing Chains

Abstract
The rotor-router model is a deterministic process analogous to a simple random walk on a graph. Instead of distributing tokens to randomly chosen neighbors, the rotor-router deterministically serves the neighbors in a fixed order. This paper is concerned with a generalized model, functional-router model, which imitates a Markov chain possibly containing irrational transition probabilities. We investigate the discrepancy of the number of tokens at a single vertex between the functional-router model and its corresponding Markov chain, and give an upper bound in terms of the mixing time of the Markov chain.