Exploration on and of networks

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Stellingen

behorende bij het proefschrift

Exploration on and of Networks

van

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1. The marginal distribution of random walk without backtracking on the dynamic configuration model is not Markovian, but it has a stationary distribution, namely, the uniform distribution on the set of half-edges (Chapter 2).

2. The total variation distance between the marginal distribution of random walk without backtracking on the dynamic configuration model and the uniform distribution on the set of half-edges converges to zero as time tends to infinity (Chapter 2).

3. Under certain regularity conditions on the degrees, the paths of random walk without backtracking on the dynamic configuration model are self-avoiding with high probability, up to a time of order $\log n$ where n is the number of vertices (Chapter 3).

4. Random walk without backtracking on the dynamic configuration model mixes at least as fast as on the static configuration model with high probability. There are three regimes, characterised by the rewiring speed: a supercritical regime in which mixing times are of smaller order than in the static setting and there is no cutoff, a critical regime in which mixing times are of the same order and there is one-sided cutoff, and a subcritical regime in which mixing times are of the same order and there is two-sided cutoff (Chapter 3).

5. Under certain regularity conditions on the degrees and on the rewiring dynamics, random walk without backtracking on the dynamically rewired graph can be coupled to a modified random walk on the static graph (Chapter 4).

6. A point in a finite subset of the plane belongs to the boundary of the convex hull of the point set if and only if for all $r > 0$ the disk of radius r centered at that point is a boundary disk of the set of disks of radius r whose centers lie in the point set (Chapter 1).

7. The expected union complexity of disk regions is of order $n^{1/3}$ when n disk centers are sampled from either a disk or a square. On the other hand, the complexity of the convex hull of a point set is of order $n^{1/3}$ and $\log n$, respectively (Chapter 1).

8. A well-known saying by George Box reads: "All models are wrong but some are useful." On the other hand, we study models not only because they are useful, but also because they are interesting.

9. The main difference between having a paper published and having a child is that you have sleepless nights before rather than after.