

Random Walks on Trees and Surfaces

This is a list of references for these lectures which were given at the Random Trees 2007 school held in Reykjavik 20-23 August 2007. It is not exhaustive but will get you started. There are many other interesting references given in the publications listed here.

Books

The Theory of Branching Processes by T.E.Harris, Dover 2002, the first chapter is a nice introduction to Galton-Watson trees (the book was first published a long time ago so doesn't have an up-to-date bibliography).

[Probability on Trees and Networks](#) by Lyons and Peres is a comprehensive maths book that starts at the beginning.

An Introduction to Probability Theory and its Applications by W. Feller, Wiley 1966, is in every library, Vol 2 is the useful one for the so-called Tauberian theorems relating asymptotic behaviour of generating functions and the original functions and lots of stuff on measures. Good for reference rather than bed-time reading.

[Analytic Combinatorics](#) by Flajolet and Sedgewick has a very detailed discussion of generating functions and transfer (ie generalised Tauberian) theorems.

Papers

Some papers describing the measure for the generic infinite trees and the infinite planar random graphs. A good starting point is Durhuus's lectures at this school for which the reference is:

Probabilistic aspects of infinite surfaces and trees, Act.Phys.Pol. **34** (2003) 4795-4811

The papers in which the approach to the spectral dimension of generic infinite trees and the combs described in the lectures is developed by Durhuus, Jonsson and myself are:

hep-th/0509191 *Random walks on combs*, J. Phys. A **39** (2006) 1009-1037

math-ph/0607020 *The spectral dimension of generic trees*, J. Stat. Phys. **128** (2007) 1237-1260

On the spectral dimension of generic trees DMTCS Proc. AG 183-92, 2006

The heat kernel on trees has been studied in many papers; you can find them by pursuing the references in

math.PR/0503118 by Barlow and Kumagai *Random walk on the incipient infinite cluster on trees*

Some papers related to the recurrence question on planar random graphs:

math.CO/0205226 by Chassaing and Schaeffer, *Random planar lattices and integrated superbrownian excursion*, Probability Theory and Related fields, **128** (2004) 161-212

math.PR/0207153 by Angel and Schramm, *Uniform infinite planar triangulations*, Comm. Math. Phys. **241** (2003) 191-213

math.PR/0011019 by Benjamini and Schramm, *Recurrence of distributional limits of finite planar graphs*, Electronic Journal of Probability, **6** (2001) 1-13