Electronic Communications in Probability > Vol. 11 (2006) > Paper 33 open journal systems

Stationary random graphs on Z with prescribed iid degrees and finite mean connections

Maria Deijfen, *Stockholm University*
Johan Jonasson, *Chalmers University*

Abstract

Let F be a probability distribution with support on the non-negative integers. A model is proposed for generating stationary simple graphs on Z with degree distribution F and it is shown for this model that the expected total length of all edges at a given vertex is finite if F has finite second moment. It is not hard to see that any stationary model for generating simple graphs on Z will give infinite mean for the total edge length per vertex if F does not have finite second moment. Hence, finite second moment of F is a necessary and sufficient condition for the existence of a model with finite mean total edge length.

Full text: PDF | PostScript

Pages: 336-346

Published on: December 15, 2006

Bibliography

1. Baum, E. and Katz, M (1965): Convergence rates in the law of large numbers, *Trans. Amer. Math. Soc.* 120 108-123, Math. Review 33#6679.
2. Britton, T., Deijfen, M. and Martin-Löf, A. (2005): Generating simple random graphs with prescribed degree distribution, *J. Stat. Phys.* 124, 1377-1397.
3. Chung, F. and Lu, L. (2002:1): Connected components in random graphs with given degrees sequences *Ann. Comb.* 6, 125-145, Math. Review 2003k:05123.
4. Chung, F. and Lu, L. (2002:2): The average distances in random graphs with given expected degrees, *Proc. Natl. Acad. Sci.* 99, 15879-15882, Math. Review 22 #10924.
5. Hofstad, R. van der, Hooghiemstra, G. and Znamenski, D. (2005): Random graphs with arbitrary iid degrees, preprint, (www.win.tue.nl/~rhofstad).
6. Holroyd, A.E. and Peres, Y. (2003): Trees and Matchings from Point Processes, *Electr. Commun. Probab.* 8, 17-27. Math. Review 2004b:60127.
7. Holroyd, A.E. and Peres, Y. (2005): Extra heads and invariant allocations, *Ann. Probab.* 33, 31-52, Math. Review 2005k:60153.
8. Molloy, M. and Reed, B. (1995): A critical point for random graphs with a given degree sequence, *Rand. Struct. Alg.* 6, 161-179, Math. Review 97a:05191.
9. Molloy, M. and Reed, B. (1998): The size of the giant component of a random graphs with a given degree sequence, *Comb. Probab. Comput.* 7, 295-305, Math. Review 2000c:05130.
10. Newman (2003): The structure and function of complex networks, *SIAM Rev.* 45, 167-256, Math. Review 2005a:05206.
11. Wormald, N.C. (1978): Some problems in the enumeration of labelled graphsm, Doctoral thesis, Newcastle University.

Electronic Communications in Probability. ISSN: 1083-589X