

Scale-free random networks

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Abstract

Network science is one of the most important theories of our century. As in his recent book [1] Barabási Albert-László emphasized 'we will never understand complex systems unless we develop a deep understanding of the networks behind them'. It is known that several real-life networks are scale-free. It means that their degree distributions are power laws. In [2] the preferential attachment model was proposed to describe the evolution of scale-free networks.

In this paper two kinds of the random graph evolution procedures are studied. Both of them are combinations of the preferential attachment model and the uniform choice of vertices. The basic unit of the first one is a complete graph on N vertices, where $N \geq 3$ is fixed, see [3], [4], [5]. In the second model the basic unit is a star on N vertices. Scale-free properties are obtained for both models.

Keywords: Random graph, preferential attachment, scale-free, power law

MSC: 05C80, 60G42

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