A continuous time model for network evolution

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Abstract

The study of networks is in great focus of many branches of science. We suggest a novel approach to modeling network evolution, based on the dynamics of independent Markov chains. Evolution is measured in continuous time units, as opposed to other models, where it is measured by a discrete counter of iterations. We derive a closed solution for the expected time until a node has any specific degree. The model produces a highly skewed degree distribution and a small world’s criteria, in agreement with real world networks. Our study demonstrates that a network of complex topology can be composed of identical elements, that have independent behavior.