State of the art
Modelling

DynGraph project
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1 Static models

Existing static graph models mainly follow two approaches. Random modelling consists in randomly sampling, with uniform probability, a graph among the set of those that have a given property, see for instance [2, 4, 8, 12, 17]. Other models take the form of an iterative construction process that eventually produces a graph with the desired properties, see for instance [1, 7, 9, 16, 19, 14]. Currently there is no consensus concerning existing models: they all have their own advantages and drawbacks, and none emerges as better than all the others.

2 Dynamic models

The main trend in dynamic network modelling has been developed in the context of ad-hoc networks, i.e. networks of wireless nodes carried by user, which can communicate only when they are close to each other. Many models have been developed for the mobility of users, in order to perform simulations for communication protocols, see for instance [3, 5].

There exist very few strong results that propose dynamic models of interaction networks, based on the observed properties of complex networks. Most of them attempt to reproduce characteristics observed in real-world networks, such as contact or inter contact durations [6, 10, 18].

The Community Guided Attachment (CGA) model [16] is a hierarchical graph generation model, in which the linkage probability between nodes decreases as a function of their relative distance in the hierarchy. [11] proposes a blog model that reproduces temporal as well as structural patterns observed in blog networks. [13] proposes a model for individual blogs which generalizes the preferential attachment model.

Finally, [15] proposes an attempt at random models in the case of dynamic graphs, by keeping the existing links of an existing network, together with the time at which they were created, and randomizing link destinations.

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