Some Advances of Statistical Methodologies in Social Network Analysis

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Abstract

The growth in the big data regime and the popularity of new media have enhanced a research migration to network pattern recognition and analysis. Recently, an increasing number of studies suggested using statistical methods to test network characteristics. In this talk, we discuss some advances of centrality measures and community detection methods in social networks. Both topics in networks are important and applicable to many different fields. For the part of network centrality, we propose a statistical method, called as *focus centrality*, to evaluate the important vertices of a network. We consider not only the degree of node, but also collect information from neighbors with different distances. For the part of the community detection, we propose a *scan statistic* for identifying attributed and structured clusters in social networks. In addition to the introduction to our methodologies, some empirical data are applied to demonstrate the performance of our methods. The development of statistical techniques apparently plays an important role in the research of network analysis nowadays.

Keywords: Social Networks; Focus Centrality; Community detection; Scan Statistic.