Social Network Analysis: Selected Methods and Applications

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Abstract. A social network (SN) is a network containing nodes – social entities (people or groups of people) and links between these nodes. Social networks are examples of more general concept of complex networks and SNs are usually free-scale and have power distribution of node degree. Overall, several types of social networks can be enumerated: (i) simple SNs, (ii) multi-layered SNs (with many links between a pair of nodes), (iii) bipartite or multi-modal, heterogeneous SNs (with two or many different types of nodes), (iv) multidimensional SNs (reflecting the data warehousing multidimensional modelling concept), and some more specific like (v) temporal SNs, (vi) large scale SNs, and (vii) virtual SNs. For all these social networks suitable analytical methods may be applied commonly called social network analysis (SNA). They cover in particular: appropriate structural measures, efficient algorithms for their calculation, statistics and data mining methods, e.g. extraction of social communities (clustering). Some types of social networks have their own measures and methods developed. Several real application domains of SNA may be distinguished: classification of nodes for the purpose of marketing, evaluation of organizational structure versus communication structures in companies, recommender systems for hidden knowledge acquisition and for user support in web 2.0, analysis of social groups on web forums and prediction of their evolution. The above SNA methods and applications will be discussed in some details.