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APPROACHES TO SOCIAL NETWORK ANALYSIS

Social network analysis is an interdisciplinary practice at the interface of different science, particularly social science, network analysis, graph theory, artificial intelligence, information search, and marketing. Network analysis solves problems of a network. Its structure can be explained by graph theory. Graph theory is a set of abstract concepts and methods for graph analyzing. The composition of these fields alongside with the analytical methods and other methods, which are developed for analyzing and viewing results of social network analysis, are the base of social analysis methods in general.

The study of society from the point of view of the study of an individual, who is involved in the network relations, allows finding logical explanations of people behavior, identifying the patterns, which cannot be detected by only one-person research. Thanks to the development of computing devices and modern technologies for the analysis of society and its phenomena it has become possible to find new prospects and opportunities. A lot of issues, which were impossible to be solved before, are now available to research.

The network analysis is used outside society science as well. The methods of network analysis have made it possible to examine the internet traffic, the information dissemination. For example, the network analysis is used for enhancing information flow in business; the law-enforcement agencies use it to detect the terrorist networks, social networks can be recommended to the potential friends and so on.

Let us take a look at the analysis of social networks, such as Facebook, Twitter, LinkedIn, Google+, GitHub etc. There are many problems to be solved at the analysis of the social networks data. They are :

1. Personal Data Privacy.
2. Access limit and number of requests.
3. The need to structure data.

Concerning the social network analysis directions the following can be highlighted:

1. Text mining analysis.
2. User identification in the different networks.
3. Content, goods and services recommendation.
4. Predicting user' behavior.
5. Searching user's friends list and groups.
6. The establishment of the hidden attributes.
7. Identifying fake threatening society accounts.

Social neworks are classified into two types: sociocentric (whole) and egocentric (personal). Sociocentric media are the connections of all the elements in the closed

population, which are focused on addressing the large group of humans, while egocentric media consider individuals.

The topicality of the given project is the identification of the social networking user's behavior patterns, predicting behavior by the Data Mining methods. A new hypotheses on the user's and group's behavior is also proposed. The system should be based on the mathematical models by means of Data Mining and it has to be able to handle bigger data. The problems of collecting information, the data receiving models, using methods to establish the links and the patterns within big data, which is received from social networks; designing the algorithms to respond to new challenges require further research. The information is becoming more accessible and understandable via the visual tools. It is important to design the algorithms, which can combine not only analysis methods, but also illustrate the information and enhance our understanding of the network structure and dynamics.

Let us look at the main metrics of social network analysis.

Density is the proportion of direct ties in a network relative to the total number possible. This dimension is often used to compare the same size graphs.

Clustering coefficient is some estimation of the network fragmentation. For example, it is the probability that two of my friends are friends to each other.

Closeness is dimensions, which show the speed of information transmission from one node to the other, relating to it.

Bridge provides the only link between two individuals or clusters.

Centrality is subtraction between the number of links for every node, divided into the maximum possible sum of subtraction.