ABSTRACT

At present, social networks play an important role in the many fields of economy, society, politics, education, etc. Social networks allow actors or communities to share messages, discuss and comment opinions on interested topics by social links in which the message contains a lot of useful information and knowledge. Each message has many special features, in which the interested topics and actors which send and receive the topics are important features. Unlike the traditional approach about viewing each message belonging to a topic, the topic model-based approach indicates that each message has the mixture of many topics where each topic has a lot of topic-interest actors and communities. The topic model-based approach is suitable to the research orientation on the Social Network Analysis (SNA). However, the previous researches have still had limitations about discovering, labeling and analyzing the variation of interested topics of actors and communities from social links with the temporal factor. The dissertation sets research goals based on limitations of previous researches with the two main goals: (i) Developing the model Temporal-Author-Recipient-Topic (TART) based on the topic model. The tasks of TART model are discovering interested topics and analyzing the role of actors on social networks with the temporal factor; labeling topics; applying the temporal factor to divide the elements, such as authors, recipients, set of topics in the corpus and finding out the variation of interested topics of actors in each period of time;

and analyzing the changes of interested topics of actors; (ii) Proposing the method for discovering communities on social networks based on the topic model with the temporal factor. The tasks of this method are: clustering actors based on features, such as interested topics, topic interest probability to find out communities of actors; and analyzing the variation of community features on social networks.

Through experimenting the proposed models and methods on two message corpuses in Vietnamese (collected from social networks at universities and online newspapers) by the software system built for the Social Network Analysis, the dissertation is completed as the planned goals.

The main contributions of the dissertation:

(1) Building up the method of discovering and labeling interested topics on social networks based on the topic model and topic taxonomy.

(2) Building up TART model to discover the role of actors based on the topic model with the temporal factor. This model also plays an important role in finding out social links among actors.

(3) Building up the method of detecting the community of actors based on the topic model. This method is the combination of TART model and Kohonen Neural Network method to discover the community of actors with the same interested topic in each period of time.

(4) Building up the software for social network analysis to fully implement the six modules on the overall research flowchart from the module for collecting data, pre-processing data, discovering and labeling interested topics, implementing TART model, and detecting communities.

The research and experiment results of the dissertation are published in journals and conferences and indexed by reputable publishers, such as Thomson Reuters, Scopus, IEEE, Springer, etc.

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