

## Chapter 13

# A Layered Parameterized Framework for Intelligent Information Retrieval in Dynamic Social Network using Data Mining

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### ABSTRACT

*Dynamic social networks contain vast amounts of data, which is changing continuously. A search in a dynamic social network does not guarantee relevant, filtered, and timely information to the users all the time. There should be some sequential processes to apply some techniques and store the information internally that provides the relevant, filtered, and timely information to the users. In this chapter, the authors categorize the social network users into different age groups and identify the suitable and appropriate parameters, then assign these parameters to the already categorized age groups and propose a layered parameterized framework for intelligent information retrieval in dynamic social network using different techniques of data mining. The primary data mining techniques like clustering group the different groups of social network users based on similarities between key parameter items and by classifying the different classes of social network users based on differences among key parameter items, and it can be association rule mining, which finds the frequent social network users from the available users.*

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## INTRODUCTION

In the modern era people are connected and communicate all over time using social network that span globally geographical area. Fan and Shelton (2009) defined “Social networks, which represent the relationships (such as friendship or co-authorship) among actors (such as individuals or companies), have been studied for decades”. Social network is a large group of people in which an individual can communicate or interact to each other at any time throughout the world. Social network comprises of city, state, country or whole world. Information sharing among the individuals can be texts, images, and videos. Social network is represented by a social graph in which nodes or vertices represent an individual or a person of the social network and links or edges represent an interaction or communication among the individuals or persons of a social network. In social network an individual can communicate and interact to other using messages or videos. Social network can be static or dynamic. In static social network most of the information is static and a person can communicate or interact to other at a particular time and all the information about the communication is removed. Static social network is represented by a social graph  $(V, E)$  where  $V$  represents an individual or a person of social network and  $E$  represents an interaction or communication among the individual of a social network at an instant of time. Nguyen et al. (2011) defined the same as “Let  $G_s = (V_s, E_s)$  be a time dependent network snapshot recorded at time  $s$ ”. In dynamic social network all the information continuously change, communication or interaction between two persons take place all over the time and all the information about the communication or interaction must be considered. Dynamic social network is represented by a social graph  $\{V(t), E(t)\}$  where  $V(t)$  represents an individual or a person of a social network and  $E(t)$  represents an interaction or communication among individuals

at all the time. Dynamic social network contains billions of users, some of them may be with the same names or different names. Finding a person based on some known information in dynamic social network does not provide the relevant information all the times. It may or may not give the relevant information all the time during a search in dynamic social network. There is a need to an intelligent information retrieval that provides the relevant, filtered and timely information to the users during a search in dynamic social network. The intelligent information retrieval system takes the inputs which processes these inputs without any user intervention and produces the output as relevant, filtered and timely information to the user. The author’s proposes a layered parameterized framework for intelligent information retrieval using data mining techniques in dynamic social network that provide the most relevant information to the user during a search in dynamic social network.

The organization of the chapter as follows: Section 2 discusses the background of the chapter that includes the subsections are, related research and motivation, research methodology, introduction to social network, introduction to data mining and introduction to intelligent information retrieval. Section 3 outlines the main focus of the chapter that includes the subsections are, parameters for intelligent information retrieval in dynamic social network, layered framework for intelligent information retrieval, empirical case example and advantages and disadvantages of framework and Section 4 summarizes conclusion and future research.

## BACKGROUND

### Related Research and Motivation

A deep study conducted on several journals article and research papers related to intelligent

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