# Abstract

Complex search describes several typical scenes during users’ search process: the users lack the knowledge or contextual awareness to formulate queries or navigate complex information spaces, the search task requires browsing and exploration, or the system indexing of available information is inadequate. In complex search, the search process of the user always has features of long span of time, complex and broad searching content. In previous studies, the laboratory team in which the author studied proposed the theory of TimeTree to help users manage the complex search process. TimeTree organizes the queries submitted by users and the searching results clicked by users into a form of tree in order of time, forming a visual description of the whole complex search process, providing an effective way for users to record and manage complex search process.

As a theoretical tool for management of complex search process, TimeTree can record users’ complex search process. Taking advantage of the fact that TimeTree can be used for managing users’ complex search process, this study discusses the search experience oriented query recommendation method. To propose the search experience oriented query recommendation method, the search experience extracting method is needed as a basis. To propose the search experience extracting method, it is necessary to prove that TimeTree contains search experience of users in complex search process. Based on this idea, this study does the research of search experience oriented query recommendation method.

First of all, this study proposes the search experience model and the search experience coherence model, which gives search experience and search experience coherence a modeled definition. Based on the search experience model and the search experience coherence model, this study designs experiment to make a systematic verification of the implication of search experience in TimeTree through 3 ways of subjective evaluation, expert evaluation and objective evaluation. After that, this study proposes the search experience extracting method, which contains the algorithm of causal experience extraction based on query-click-query sequence recognition and the algorithm of thematic experience extraction based on subtask partition aiming at causal experience and thematic experience in the search experience model respectively, and carries out experimental verification of the algorithm of thematic experience extraction based on subtask partition. Then this study proposes the search experience oriented query recommendation method and query recommendation visualization method, and carries out experimental verification of the search experience oriented query recommendation method. At last, a search experience oriented query recommendation system is designed and implemented to make this study a complete set of solutions.

**Key words:** complex search; query recommendation; TimeTree; search experience