Task Trail: An Effective Segmentation of User Search Behavior

Abstract:

In this paper, we introduce "task trail" to understand user search behaviors. We define a task to be an atomic user information need, whereas a task trail represents all user activities within that particular task, such as query reformulations, URL clicks. Previously, Web search logs have been studied mainly at session or query level where users may submit several queries within one task and handle several tasks within one session. Although previous studies have addressed the problem of task identification, little is known about the advantage of using task over session or query for search applications. In this paper, we conduct extensive analyses and comparisons to evaluate the effectiveness of task trails in several search applications: determining user satisfaction, predicting user search interests, and suggesting related queries. Experiments on large scale datasets of a commercial search engine show that: (1) Task trail performs better than session and query trails in determining user satisfaction; (2) Task trail increases web page utilities of end users comparing to session and query trails; (3) Task trails are comparable to query trails but more sensitive than session trails in measuring different ranking functions; (4) Query terms from the same task are more topically consistent to each other than query terms from different tasks; (5) Query suggestion based on task trail is a good complement of query suggestions based on session trail and click-through bipartite. The findings in this paper verify the need of extracting task trails from web search logs and enhance applications in search and recommendation systems.