Chapter VII
Combining Relevance Information in a Synchronous Collaborative Information Retrieval Environment

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ABSTRACT

Traditionally information retrieval (IR) research has focussed on a single user interaction modality, where a user searches to satisfy an information need. Recent advances in both Web technologies, such as the sociable Web of Web 2.0, and computer hardware, such as tabletop interface devices, have enabled multiple users to collaborate on many computer-related tasks. Due to these advances there is an increasing need to support two or more users searching together at the same time, in order to satisfy a shared information need, which we refer to as Synchronous Collaborative Information Retrieval. Synchronous Collaborative Information Retrieval (SCIR) represents a significant paradigmatic shift from traditional IR systems. In order to support an effective SCIR search, new techniques are required to coordinate users’ activities. In this chapter we explore the effectiveness of a sharing of knowledge policy on a collaborating group. Sharing of knowledge refers to the process of passing relevance information across users, if one user finds items of relevance to the search task then the group should benefit in the form of improved ranked lists returned to each searcher. In order to evaluate the proposed techniques the
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INTRODUCTION

The phrase “Collaborative Information Retrieval” has been used in the past to refer to many different technologies which support collaboration in the information retrieval (IR) process. Much of the early work in collaborative information retrieval has been concerned with asynchronous, remote collaboration via the reuse of previous search results and processes in collaborative filtering systems, collaborative re-ranking, and collaborative footprinting systems. Asynchronous collaborative information retrieval supports a passive, implicit form of collaboration where the focus is to improve the search process for an individual.

Synchronous collaborative information retrieval (SCIR) is an emerging form of collaborative IR in which a group of two or more users are explicitly collaborating in a synchronised manner in order to satisfy a shared information need. The motivation behind these systems is related to both the ever-growing corpus of human knowledge on the web, the improvement of social awareness on the internet today, and the development of novel computer interface devices. SCIR systems represent a significant paradigmatic shift in focus and motivation compared with traditional IR systems and asynchronous collaborative IR systems. The development of new IR techniques is needed to exploit this. In order for collaborative IR to be effective there needs to be both an appropriate division of labour, and an effective sharing of knowledge across collaborating searchers (Zuboff, 1998; Foley et al., 2006). Division of labour enables each collaborating group member to explore a subset of a document collection in order to reduce the redundancy associated with multiple people viewing the same documents. Sharing of knowledge enables collaborating users to benefit from the knowledge of their collaborators. Early SCIR systems provided various awareness cues such as chat windows, shared whiteboards and shared bookmarks. By providing these cues, these systems enabled the collaborating searchers to coordinate their activities in order to achieve a division of labour and sharing of knowledge. However, coordinating activities amongst users can be troublesome, requiring too much cognitive load (Adcock et al., 2007).

Recently we have seen systems to support a more system-mediated division of labour by dividing the results of a search query amongst searchers (Morris and Horvitz, 2007), or defining searcher roles (Adcock et al., 2007). However, there has been no work to date which addresses the system-mediated sharing of knowledge across collaborating searchers. In this chapter we introduce our techniques to allow for effective system-mediated sharing of knowledge. We evaluate how a sharing of knowledge policy affects the performance of a group of users searching together collaboratively. But first, in the next section, we provide a comprehensive account of work to date in synchronous collaborative information retrieval.

SYNCHRONOUS COLLABORATIVE INFORMATION RETRIEVAL

Information retrieval (IR), as defined by Baeza-Yates and Ribeiro-Neto (1999), is concerned with
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