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Active Recommendation and their Evaluation

Abstract: Distributed Information Systems (DIS) such as the Internet, the World Wide Web, corporate intranets, databases, library information retrieval systems, etc, serve large and diverse communities of users by providing access to a large set of heterogeneous electronic information resources. They also permeate our lives today in unprecedented ways. As the size and complexity of DIS increases, we have witnessed the evolution of Information Retrieval towards systems that are capable of filtering and recommending relevant information stored in DIS to users.

We discuss in particular, two adaptive recommendation systems named *TalkMine* and *@ApWeb*. *TalkMine* operates at the semantic level of keywords. It leads different databases to learn new and adapt existing keywords to the categories recognized by its communities of users using distributed algorithms. *@ApWeb* operates at the structural level of information resources, namely citation or hyperlink structure. It relies on collective behavior to adapt such structure to the expectations of users. *TalkMine* and *@ApWeb* are currently being implemented for the research library of the *Los Alamos National Laboratory* under the *Active Recommendation Project*. Together they define a biologically motivated information retrieval system, recommending simultaneously at the level of user knowledge categories expressed in keywords, and at the level of individual documents and their associations to other documents. Rather than passive information retrieval, with this system, users obtain an active, evolving interaction with information resources.

We also discuss ideas to develop an appropriate methodology to evaluate active recommendation systems. We propose a methodological change that mirrors the evolution from the traditional information retrieval paradigm to the more recent collaborative systems. Ours is a simulation approach based on the interaction between users and DIS, which relies on models of associative knowledge shared by communities of users. Instead of attempting to describe the semantics of individual documents, as current methodologies do, we investigate a general means of assessing how recommendation systems may reliably possess a valid representation of the knowledge of their user communities.