

Ant World

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1 Overview

The Ant World system facilitates collaborative information retrieval on the Internet, i.e. to make it easier to find useful information on the Internet. It asks users' opinion on whether the documents they view are useful for their goals, and uses this feedback to guide other users in their searches.

Our approach [2] is conceptually motivated by two important concepts from the domain of biology: neuronal networks and communication via pheromones. At the global level we enable the network to update its search information dynamically like a vast neuronal network, while at the local level the acquisition and deposition of link information is akin to pheromonic marking of sites and trails by insects. With this analogy in mind we will refer to the information about the value of links as *Digital Information Pheromones* (DIP). The resulting network is continuously adaptive.

2 How it works

Ant World works as an extension to a Web browser. When starting her or his quest, an Ant World user formulates the goals of the quest in a *short description*, similar to a search engine query, and an optional *long description*, resembling a TREC query. As the user browses the Web, a small "console window" hovers on top of the screen, soliciting the user's opinion on the usefulness of the pages he visits for the goals of his quest. This explicit feedback technique distinguishes our system from popularity-ranking systems such as Direct Hit [3], which try to infer the user's opinion based on indirect parameters, such as the time spent viewing a document.

The users' itineraries (sequences of the web pages they have visited) and the judgments they have made are stored, analyzed, and used to guide other users looking for information on similar topics, by compiling suggestion lists, and marking links to "useful" pages with an ant icon.

Determining whether two quests are similar, or *quest matching*, is not a trivial task, since users may use different words to describe similar goals. Along with the short and

long descriptions provided by the user, we use the content of the pages the user has judged "useful" as the *extended description* of his quest. Thus the quest description grows as the quest progresses, allowing for dynamic quest matching. This is analogous to relevance feedback in IR.

3 Architecture

The team of cooperating searchers installs the *Organizational Ant World Server* on a host central to their organization. This organizational-level server includes the Ant Database Server, storing information about all Ant World quests that have been run by the group members, and a number of servlets, including the *Organizational Ant Proxy Server*, that monitor and guide users' searches, and collect users' feedback. To improve efficiency and scalability of the system, every participating user installs on his workstation the *Local Ant Proxy Server*: a Java program helping the browser to redirect requests to the organizational server.

4 What do you need to use the Ant World

The end user needs a fast workstation running UNIX (we have used Solaris and LINUX) or MS Windows 95, with a network connection that allows painless Internet browsing (a 28.8 Kbps modem or Ethernet connection). As the web browser, Netscape Navigator version 4.08 or higher must be used. (Unfortunately, the JavaScript code we use can't work with other browsers at the present time). The computer should also be provided with a Java Virtual Machine.

At the organizational server a web server supporting servlets is needed. We use Sun's Java Web Server 1.0.3, or Apache 1.3.6 with JServ. For the organizational database server, we use Sybase SQL Server 11.

You can download the Local Ant Proxy Server from our web site [1], and start using the Ant World immediately, using our organizational proxy server. Contact us if you want to set up your own organizational Ant World Server.

References

- [1] The Ant World site, <http://aplab.rutgers.edu/ant>
- [2] Paul B. Kantor, Benjamin Melamed, Endre Boros, Vladimir Menkov. *The Information Quest: A Dynamic Model of User's Information Needs*. Accepted for presentation at the 1999 ASIS Annual Meeting
- [3] The Direct Hit web site, <http://www.directhit.com>

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