Intelligent Agents on the Internet

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Recent advances in the Internet technology and the increase of the Internet users have increased dramatically the complexity of information work and, at the same time, the competition in the global market. As a result, there is a great demand for new tools to improve the productivity of information workers by freeing them from tedious and repeating tasks, such as, information searching and retrieval. Such new tools have been referred to as agents.

The agent approach represents a fundamental shift in the human-computer interaction paradigm and has gained significant attention over the past few years. As stated in a recent Science article: "...the agent approach transforms the computer user from a worker into a manager. You delegate tasks to a set of agents who do things for you." For instance, an agent can repeatedly help search for business counterparts, monitor stock prices or currency exchange rates, and make buy or sell recommendations.

The basic idea of the agent research is to develop software systems which "engage" and "help" all types of end users. Broadly defined, an "agent" is a program that can operate autonomously and accomplish unique tasks without direct human supervision (similar to human counterparts such as real estate agents, travel agents, etc.). Such agents might act as "spiders" on the Internet and look for relevant information, schedule meetings on behalf of executives based on their constraints or the patterns the agent learned previously, or filter news groups articles based on the "induced" (or learned) users' profiles. Agents can also receive assignments and instructions from the clients, then based on the models or engines, accomplish the assignments. Some researchers attempted to address the question: "How should agents interact with each other to form digital teamwork on Internet?" Other researchers are more concerned about designing agents which are "robust", "intelligent", and "human-like".

We selected seven papers for presentation in our two sessions. The first set examines the issues that related to information searching on the Internet. The first paper, Intelligent Spider for Internet Searching, discusses how to use the new Internet programming language, CGI and Java, to develop new interface for spiders. Such interface provide two-way communications between the users and spiders. The users can modify parameters for searching and spiders keep users informed of the progress of searching. They also explore several algorithms to develop spiders, which include best-first searching and genetic algorithms.

The second paper, Intelligent Agents for Matching Information Providers and Consumers on the WWW, discuss various issues in helping users of WWW to locate relevant issues. Which include the identification of key components in building such intelligent system. Their major contribution is that the system is able to analyze the browsing behavior of users and identify what are their hot topics.

The users of Internet are suffering from long retrieval latency and lack of searching function to support for localized search or hierarchical search. The third paper, Virtual Proxy Servers for WWW and Intelligent Agents on the Internet, propose a framework to solve the above problems by introducing a new model for WWW proxy server to support intelligent agents on the Internet, such as, searching agents.

The fourth paper, A Generic Virus Detection Agent on the Internet, provide a discussion about VICEd, a system for generic virus detection over the Internet. VICEd is based on a virus detection which combines the software emulation and knowledge base.

The fifth paper, An Interactive Scheduling Agent on the Internet, proposes a new approach to design and development of an interactive scheduling system for the Internet users. This system provides the interactive supports for the participants to schedule or allocate limited resources.

The sixth paper, Intelligent Agent Based Contract Process in Electronic Commerce: UNIK-AGENT Approach, proposes a framework for electronic commerce. For using such system, the grammar of contract, the new contract types, and the traditional contracts can be defined or expressed. They also proposed a three-layer model for the agents to support electronic commerce: Agent communication language, electronic commerce, and production specification.

The last paper, Human Agents and Intelligent Agents: An Experiment on the Internet, propose an experimental approach to study the limitations of software agents. For a simple market, it is still be able to see that human subjects cannot transfer all the knowledge or strategies to the software agents. Such limitations affected the performance of agents and, therefore, at this moment it is too risky to apply intelligent agents on the critical and high-risk tasks.