

BioAgent - A Multi-Agent systems for automatic information extraction

E. Merelli, L. Mariani, R. Culmone

Dipartimento di Matematica e Informatica - Università di Camerino

The postgenomic era is characterized by the large amount of data available from sequencing experiments. Each scientific institute works on different projects; therefore, data increases rapidly as do the difficulties in managing and sharing information among all potential users. Browsing and searching are expensive activities because extensive time is required to find the appropriate information. Furthermore, interesting experiments that might contain relevant information may have been carried out in locations which have escaped our notice. Certainly it is impossible to search among all information sources, but it is possible to do thorough and exhaustive automatic searches.

User-friendly web interfaces and search engines are the most widely used information gathering tools. However, often the amount of data to be processed is prohibitive for complex interactions. The lack of bandwidth is one of the main limitations on user activities. The internet infrastructure is unable to efficiently transmit and receive so much data.

This situation can be improved by using mobile agent-based systems. A mobile agent is a computational unit capable of migrating to different sources from any location. Using mobile agents, we send the program to the data resources by diminishing network traffic caused by data transfer. An agent can interact remotely with its user, behaving in a pro-active, adaptive and reactive way. Agents do not require the presence of the user, so we can assign them a task, send it over the web and then close the connection. Agents work off-line, but can provide us with results the next time we login.

BioAgent is a multi-agent platform for genomic data analysis. Agents travel among multiple places and use various tools, as Blast, Kohonen maps etc., on local repositories. Users can send a group of agents on a selected set to information collection locations. An information integration procedure takes place before the answer is deployed to the user.

Agent technology is also related to the artificial intelligence field; therefore, intelligent information extraction, information integration, planning activity, pro-active and reactive behavior, and other typical features are present in all multi-agent systems.

BioAgent aims to solve many problems of the bioinformatics community by providing opportunities to search off-line, to share data efficiently, to collect information, to integrate and manage scientific results from multiple sources and to attempt the transformation of the actual fragmented scenario into a solid, homogeneous, and user-friendly environment.