

DNA-microarray data integration using the mobile architecture: a new approach for researchers cooperation in the genome era

Ezio Bartocci, Rosario Culmone

Dept. of Mathematics and Computer Science, University of Camerino
62032 Camerino, Italy

Laura Soverchia, Mauro Angeletti

DMCA - University of Camerino
62032 Camerino, Italy

email:{ezio.bartocci,rosario.culmone, laura.soverchia, mauro.angeletti}@unicam.it

Abstract

Microarray has been developed initially as a potent high-throughput technology to simultaneously quantify genome-wide expression. In the recent years, microarray technology is involved toward distinct directions without almost any standardization. In fact, it should be taken into account that several biomolecular protocols (platforms) have been adopted together with different experimental designs. Furthermore, several strategies to analyze data (statistical parameters used to describe the experimental raw data, normalization procedures, etc.) have been adopted. The correct handling and subsequent analysis of the experimental raw data represent one of the most critical steps of this technique. The aim of the microarray user is to have meaningful answer of his/her starting biological hypotheses. This goal can be accomplished by suitable cluster analysis of a set of distinct gene-expression experiments (a serie). The clustering procedure can be applied to chosen serie(s) to group similar genes and/or similar experiments. The present project is based on the use of intelligent mobile agents, capable to search for useful data sets upon the experimenter's query. Other ways to accomplish this workflow are already present in the web (GEO), but they rely on a central server-based architecture. In particular, GEO data repository is not intended to substitute primary resources collected by single groups. On the other hand and not in contrast, our proposal is based on distributed data repositories interconnected by intelligent agents able to perform high-level workflows such as cluster analysis (BioAgent architecture). In this context, Bioagent is able to interact with primary, secondary and even with tertiary resources as GEO.