Send Fredo off to Do This, Send Fredo off to Do That

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Abstract. Fredo is a generic domain-independent broker that creates value-added information taking into account the preferences specified by its clients. Fredo uses ontology services and yellow pages services to discover a set of agents that can provide information relevant to its clients’ requests. Fredo uses an intelligent heuristic strategy based on a fuzzy evaluation mechanism to plan the queries it uses to gather relevant information for its clients’ needs. In order to handle possible information overload, we have designed a special purpose interaction protocol, the paged information-request protocol, which is used to govern the interaction between Fredo and information providers. Fredo also uses a fuzzy inference engine to evaluate the gathered information with respect to the preferences specified by its clients. Fredo has been developed by and used in the Agentcities project. Fredo uses the FIPA ACL inter agent communication language with FIPA SL contents. It was implemented in JAVA and Prolog and runs on FIPA++, a FIPA compliant agent platform.

1 Introduction

In open agent systems such as that of the Agentcities project [17] it is important to have agents capable of dynamically creating value-added information for the user or for other agents. Furthermore, the process by which information is sought, integrated, and evaluated should be as independent as possible of the particular application domain so that it can be used in different domains, relying on different ontologies.

Fredo is a broker agent capable of searching information from various sources, pertaining diverse topics, integrating it in coherent ways and evaluating it according to specified preferences. Fredo uses absolutely general algorithms in the sense that they are totally independent of the application domain.

Fredo was built using some original proposals and ideas from several other authors and research groups. The main contributions to the state of the art of engineered software agents are the integration of several ideas put forth by other researchers in a

* The research described in this paper is partly supported by the EC project Agentcities.RTD, reference IST-2000-28385 and partly by UNIDE/ISCTE. The opinions expressed in this paper are those of the authors and are not necessarily those of the Agentcities.RTD partners. The authors are also indebted to all other members of the Agentcities ADETTI team.
single implemented agent working in an open environment; the original proposal regarding the representation of preferences; the paged information-request protocol, a new interaction protocol used to handle possible information overload; and deploying all the above using the FIPA standardization framework (FIPA++ [8], a FIPA compliant agent platform; FIPA ACL agent communication language [11]; and FIPA SL content language [12][1]). Fredo also relies on the existence of FIPA compliant directory and ontology agents (DF [10] and OA [11]).

Fredo may be used in several scenarios, such as the one represented in Fig. 1. Fredo receives information requests from its clients. In general, it is impossible to satisfy the client’s request consulting only a single information provider. The relevant agents are discovered by contacting Directory Facilitator agents and Ontology agents, using the information contained in received requests.

Section 2 describes Fredo and analyses the obtained results. Section 3 compares our approach with related work. Finally, section 4 presents conclusions and future work.

2 Fredo: An Information Broker Agent

In order to satisfy clients’ requests, Fredo discovers information providers relevant for the received requests (Task 1 in Fig. 2); it plans queries to send to the discovered providers using a fuzzy heuristic rule (Task 2 in Fig. 2); and it integrates the information received from the providers, evaluates it using a fuzzy inference mechanism and sends it to its clients (Task 3 in Fig. 2). All these steps of Fredo’s operation are absolutely general in the sense that Fredo does not hold any domain dependent information and it does not use any domain dependent algorithm.