Service Matching in Agent Space

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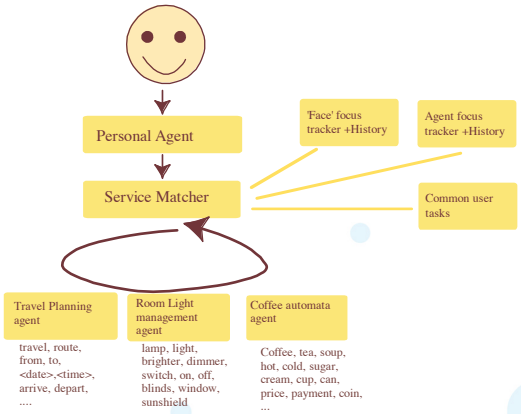
Problem: Huge Agent Space

Emerging distributed agent systems, smart buildings, grid computing and many other architectures leave the user lost between a big heap of agents. We are researching means to support the user in finding an agent matching his needs.

Service Matcher

We built a service matcher that can find an agent that best matches the user's natural language request. Once an agent is selected, that agent is 'activated': it spawns a suited interface to ask the user about the details of his request, and completes it.
The user's focus is taken into account in this search. To do this, we start the search with the agent he is looking at, where he is, what he was doing, and what his usual tasks are.

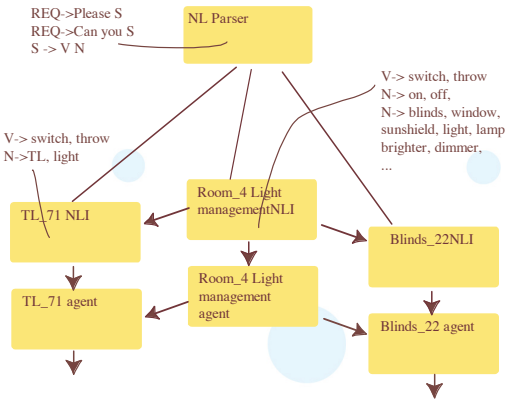


Ad-Hoc Agent Space

We use the JADE agent platform (http://jade.cselt.it), and at the core all services adhere to the FIPA agent protocols (www.fipa.org). This allows us to run a distributed agent system where agents and platforms can break down while other parts of the system keep running. Agents can react unpredictable, or even not at all. The service matcher may be slowed down a bit by inresponsive agents, but it will continue the search and come to a user suggestion.

Query Interpretation

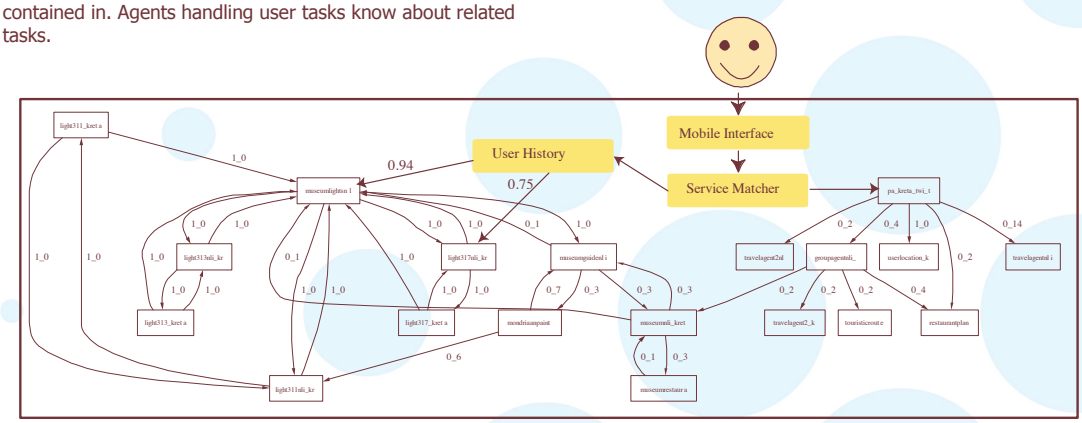
The interpretation of the user's query is separated from the execution of the interpretation. This allows the service matcher to detect various cases that need special attention. For instance multiple agents may be positive, in which case the user should select one. The interpretation essentially converts the user's query into a FIPA message, which can be executed (that is, send) if found appropriate by the service matcher.



Searching Hierarchically

In a large agent space it becomes impossible to query all agents for a user's request. To guide the search, agent space has been organized in spatial and task-related sense. Agents representing spatial areas know how large an area they represent, what agents they contain and what they are contained in. Agents handling user tasks know about related tasks.

The figure below shows our test agent space, and enlarged the service matcher agent. The service matcher first asks the personal agent and user history agent whether they understand the user's request. If not, they are asked for their relations, and those are checked next.



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