

Chapter 8.10

From Planning Tools to Intelligent Assistants: Meme Media and Logic Programming Technologies

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ABSTRACT

This chapter introduces an approach for creating Web application capable of operating in complex environments is introduced. The approach shows how Meme Media technologies combined with other technologies can be used for solving deferent kinds of problems in particular related to Therapy Planning in clinical trials. Combination of logic programming and fuzzy logic for creating Web applications is also introduced.

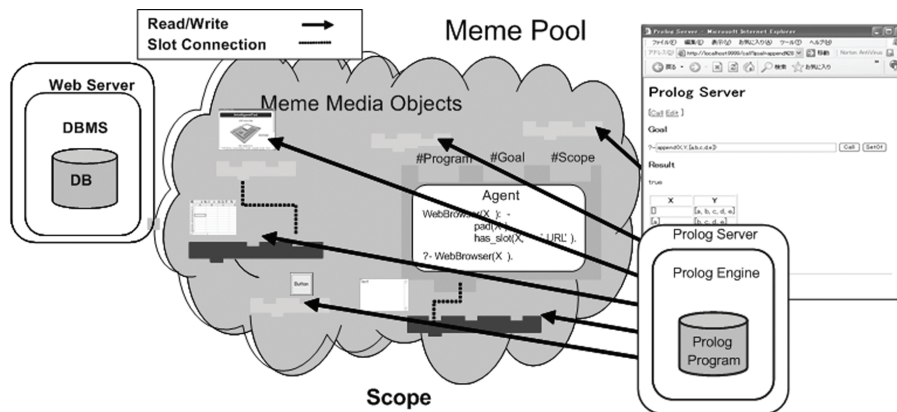
Introduction and Motivation

Nowadays a large variety of Web technologies enable end users easily to use various services

through their Web browsers. At the same time the evolution of these technologies causes various difficulties and makes high demands on software developers to create not only a static repository of hypertext information and graphics but also software that have intellectuality and mobility and that respond dynamically to user input.

Creating Web-based agents is one more step towards creating sites having artificial intelligence. One of the most interesting and promising approaches to programming agents is **logic programming** of agents (Davison, 2001). This approach has good prospects, because the ideology and principles of logic programming are very convenient for searching, recognition, and analysing unstructured, poorly structured, and hypertext information.

Figure 1. An HTTP-based Prolog server



This chapter proposes an approach for creating and using **agent systems** in Web applications through their Web browsers (Ito & Tanaka, 2003; Tanaka, 2003). The approach allows users to manipulate pads in the **IntelligentPad** environment by using remote http servers as the Prolog Server and the MATLAB Web server.

Agent-System for IntelligentPad Environment

IntelligentPad architecture allows users to combine media objects (called pads) through their view integration (Ito & Tanaka, 2003; Tanaka, 2003; Tanaka, Fujima, & Sugibuchi, 2000).

Figure 1 shows an agent systems that combine media objects on behalf of users. Implementation of the system consists of two dependent parts:

- An HTTP-based Prolog Server, and
- Coordination of **Meme Media** objects through Prolog.

The Prolog server is a Web application that evaluates Prolog goals given by client programs such as Web browsers. HTML-based Web interface provides an input form for the goal clause to be sent to the server. The server evaluates the submitted goal clause and returns its result to users

in the HTML format. Users and/or programs can use computation resource of remote computers through **logic programming** language **Prolog**. Client programs can also upload Prolog programs to the server. Since the Prolog server is a Web application, Prolog server can be wrapped by a **WebApplicationWrapperPad**. For the details of the **WebApplicationWrapperPad**, we refer the reader to our previous work (Ito & Tanaka, 2003).

Prolog server wrapped as a pad is called **AgentPad**. An **AgentPad** has coordinates pads in a meme pool, on behalf of users.

Coordination of Meme Media Objects

Our task was to create an **agent system** (**AgentPad**) that automatically monitors Web application environments and, because it has learning abilities, can also maintain a set of the last n results. This data can then be used to condition new task structures.

For details of elementary predicates that coordinate pads, we refer to our previous work (Ito, 2005).

Definition of a **Scope** A **Scope** is defined by the predicate “in scope.” The following clause defines a scope in which the drawing area of each pad is contained in the drawing area of **PrologPad**.

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