Performance Analysis of Knowledge-based Recommender System for Formalized Experience Reuse

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Abstract

In this article we present the results of performance analysis of a recommender system for formalized experience re-use. This analysis was performed within scope of the Pellucid a 5th FP-IST Project. The results were used also for assessment of usability of the Pellucid system in production environment. The Active Hint (AH) paradigm is used for formalization of experiences in Pellucid. AH simply tells the user what action to take in a given context with a given resource. The performance analysis shows the capability of such recommender engine (implemented with software agent technology) to provide AHs under certain conditions. The results show that the speed of matching proper AHs in a given context depends on many factors, including the number of events, resources, concurrently processed threads or that of processed Active Hint templates. Some of these dependencies are presented in this article in the form of graphs. We conclude with the possible solutions how to increase the performance of AH generation in such knowledge-based recommender framework

1. Introduction

In the process of designing and building the knowledge-based (KB) system, the programmers should be aware of the requirements on overall system performance to avoid further rebuilding steps. In this article we present the results of performance analysis of a recommender system for formalized experience re-use. This analysis was performed within scope of the Pellucid a 5th FP-IST Project. The results were used also for assessment of usability of the Pellucid system in production environment.

We first pose an overview on Pellucid framework as a test bed for performance analysis of KB recommender system. We describe particular modules of Pellucid system and sketch its critical parts as well. Every module is implemented as autonomous agent within the Pellucid, but we don't concern with performance of agents.

Along with the results of tests we describe the testing issues, testing environment and paradigms that occurred during the testing with different settings supplemented with the short test evaluation.

We conclude this paper by emphasizing the importance of KB design phase and giving an overview on issues that have to be considered in order to build effective KB system. We describe possible solutions how to enhance performance of our test bed application.

2. Pellucid system overview

First of all, the investigated system must be sufficiently described before we start to concern about the testing issues.

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