

Indexation by subsumption in Cased based reasoning

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Abstract

Reasoning by re-using past cases is a powerful and frequently applied way to solve problems for humans.

A case based reasoner solves new problems by remembering a previous similar situation and by reusing information and knowledge of that situation by adapting solutions that were used to solve old problems. A new problem is solved by retrieving one or more previously experienced cases, reusing the case in one way or another, revising the solution based on reusing a previous case, and retaining the new experience by incorporating it into the existing case-base. The cycle of a commonly agreed case based reasoning system has the phases retrieval of source cases, reuse of retrieved source case solution, adaptation of the suggested solution to the needs of the target problem, and storage of the solved target case. In this paper we present an approach to case based reasoning in the context of object based representation systems, where cases and indexes are represented in a hierarchy. When the cases and indexes are organized in hierarchies, the links between case based reasoning and classification are very close. The classification process is used to manage the hierarchy and is directly related to the retrieval and adaptation operations. Some examples are given to show the retrieval and adaptation processes when the index representation based on the notion of subsumption defined in description logics.

Key Words and Phrases: Object Oriented Knowledge Representation, Case Based Reasoning, Description Logics, Classification.