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A heuristic - based approach to effective exploring of large knowledge bases

Exploring of expert systems with large Knowledge Base (KB) are very time consuming and inefficient. Human experts have some heuristics about the selection

of rules for answering questions. This feature has not been exploited as a feature of expert systems to date. Expert system technology has researched into various techniques in conflict resolution. The issue of need for exploring large KBs for answering questions has not been addressed. We argue that this can be addressed by considering how human expert heuristically analyze and classify their knowledge for problem solving.

In developing this approach, a rule analyzer is developed for classifying rules depending on various heuristic measures such as commonly used rules, conflicting rules, unused rules, etc. and fed into the heuristics module. If the heuristically selected rules are not sufficient to answer the question, the system explores the main KB. If this option is also failed, the user is allowed to introduce new rules to the main KB.
As time goes on, since the system avoids the unnecessary exploration of a large KB, this approach clearly reduces the reasoning time but improves the accuracy of the answers. Further, it provides a sensible mechanism to update the rule base, by KB. Our approach extends the list of traditional features of expert systems; processing of incomplete information, explaining ability, handling uncertainty, ect. By adding one more feature of heuristic-based rule analysis of human experts.

The prototype of the system is tested incrementally. At present system shows a fifty percent reduction of reasoning time on the average. This figure improves as time goes since the heuristic model evolves during the process of using the system.