

## **Abstract**

In this thesis a knowledge base representation schemes using XML is presented. The inference mechanism implementation using XML associated tool is described. This work has concentrated on issues in using XML for representing the knowledge base as well as in using XML associated tools to build an inference engine to directly reason on this representation.

The algorithm proposed in this thesis is for knowledge base refinement. The main goal of this algorithm is to generate new, refined, and verified rules that not only cover the initial rules, but also enhance the reasoning mechanism. The refined knowledge bases are also represented using XML. The main idea of this algorithm is to extract, and expand the findings in order to detect the subsumsion between the candidate findings and the refined knowledge base, and then generate a causal model for those candidate findings that can be used to determine the disorders list.

Previously developed knowledge bases for strawberry, wheat, rice, and cucumber have been refined using the proposed algorithm, and the results are briefly outlined in the thesis.

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