Abstract

Developing the expert system (ES) using conventional programming languages is very tedious task. Therefore, it is not surprising that tools have been developed that can support the knowledge engineer. Separate tools now exist to support the knowledge acquisition and to support the implementation. Fuzzy set theory is used to capture imprecision in inputs and outputs of models, and fuzzy expert systems are used as a method of reasoning with imprecision. Fuzzy expert system permits handling uncertainties, ambiguities, and contradictions in the knowledge. In this research, a tool is proposed for development of web-based expert systems and utilizes fuzzy logic and semantic web technology which permits the knowledge engineer and domain expert to define the knowledge without having to know anything about programming languages and AI. The knowledge can be conceptualized using WordNet. The tool can induce new rules based on the semantic similarity of the concepts using WordNet. During acquiring the knowledge by a proposed tool using domain expert, the fuzzification process can be performed for values of in the acquired knowledge, then, the fuzzy inference can be initiated that has derivation of the control outputs based on the calculated fire strength and the defined fuzzy sets for each output variable in the consequent part of each rule. Finally, defuzzification is performed that involves weighting and combining a number of fuzzy sets resulting from the fuzzy inference process in a calculation, which gives a single crisp value
for each output. Using a proposed tool, the Web-based fuzzy expert system can be developed simply and takes short time and effort. The proposed tool is evaluated by using the diagnosis domain of air pollution diseases.

References

Developing Web-based Semantic and Fuzzy Expert Systems using Proposed Tool


Index Terms

Computer Science
Web Services

Keywords