

Generation of Natural Language Explanations of Rules in an Expert System*

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Abstract. We present a domain-independent method for generation of natural language explanations of rules in expert systems. The method is based on explanatory rules written in a procedural formal language, which build the explanation from predefined natural language texts fragments. For better style, a specific text fragment is randomly selected from a group of synonymous expressions. We have implemented 16 groups of explanatory rules and 74 groups of explanatory texts containing about 200 text fragments.

1 Introduction

Expert systems are widely used to solve particular problems in a rather narrow area of expertise. They are based on knowledge obtained during interaction with human experts in the field, so they are also often referred to as *knowledge-based systems*.

One of important requirements for an expert system is the system's ability to explain its conclusions in a manner understandable to the user. The best form of presenting such an explanation is a text in natural language [5]. One approach to generation of explanations is to use as explanation the rules from the knowledge base that were fired during reasoning [6]. Another approach is writing special code that paraphrases the rules [8]. These approaches do not allow for description of the ideas behind the fired rules. An alternative is to use another knowledge database for generation of explanations [7]. This approach requires a double amount of work for constructing knowledge bases.

In this paper, we present a method that allows for representation of the ideas behind the rules, does not require any additional knowledge bases, and is domain-independent—i.e., it does not require reprogramming of an explanation system if the knowledge base is changed.

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