

A Fuzzy Expert System for Car Evaluation

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ABSTRACT

In this work, a fuzzy expert system (FES) is designed and developed to help customers in selection of a car. The work is supported on fuzzy expert system (FES) that was implemented with the data bases and expertise of customers. The input variables taken in this fuzzy expert system are same as used in literature. All these factors give an efficient car evaluation.

KEYWORDS

Car, Evaluation, Expert System, Fuzzy Expert System, Fuzzy Logic, Input, Mamdani, Membership Function, Sugeno

1. INTRODUCTION

Planning is always required before buying a car. Planning involves budget for the car, maintenance, no. of persons in the family, level of safety required by the person etc. These factors can help in selection of a right car. But still it is a difficult task because many options are available now days. This work is meant to develop an intelligent system which will help the customer to select the right car based on aforesaid factors.

The intelligence exhibited by the machine or software is called artificial intelligence. Artificial intelligence means not a natural intelligence. It is an interdisciplinary field that covers science, mathematics, neuroscience and computer science. Reasoning, knowledge, planning, natural language processing are the main goals of artificial intelligence. To fulfill these goals and to learn about intelligence, a machine called artificial intelligent machine is used. The intelligent systems often discover from a certain set of inputs and outputs. They accumulate knowledge in their memory, simplify them and get ready to handle new circumstances. AI technologies have been effectively explored to their complete levels in the problem-solving domains. They provide reasons about the problems as well as solutions by using different concepts

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and methods for building programs. The expansion of expert systems for decision making is the most commonly used AI application

In expert system, the decision-making capabilities of a human expert are emulated by a computer system. Expert systems are the part of artificial intelligence. These are the computer programs which deal with incomplete and uncertain data. Expert systems represent domain specific knowledge. The expert systems can consider the problems to take out new information. They can achieve the knowledge from practice and make the predictions by using processes like natural evolution. The expert systems allow some probable results to be chosen with different grade of confidence. The output of an expert system may be informative, a lesson or a risk ruling. An expert system consists of two parts. These parts are the knowledge base and inference engine. The facts and rules are represented by the knowledge base. This is the role of inference engine to apply the rules to the facts and it has an explanation and debugging capabilities. In an expert system, to train a person, the knowledge is always provided by the domain expert or knowledge engineer. The knowledge engineer encodes the information to the knowledge base. The knowledge base is having the knowledge of the system. It behaves like an intelligent assistant as human expert. The Inference Engine draws a conclusion from the knowledge contained by the knowledge base. It is responsible for getting the final solution from the initial information.

The development of expert system is based on four phases. These four phases are research and review, knowledge acquisition, modeling, implementation. The phase research and review are necessary for providing the knowledge of previous work done and the existing technologies of a particular field. The literature review helps to formulate the problem definition and develop the new techniques for solution to the formulated problem with better performance.

Expert systems and machine learning methods often provide the knowledge like a human being. Thus, acquisition of knowledge is the main task associated with the concerned problem. The aim of knowledge acquisition is to obtain the precise information about the different attributes of vehicles. Modeling is the way to make the structure of the interface visible to the users. Implementation is the process of putting a decision into execution. It is a realization of a technical specification or algorithm as a program.

Fuzzy logic is a volitional set that holds the feelings of an individual. It is a technique for computing supported on partial truth values. The partial truth values are always among the completely false and completely true

Fuzzy expert systems are grouping of rules and membership functions. Fuzzy systems are sloping towards mathematical processing. Fuzzy logic is a developing tool for its modeling using real values taken from structured range. It is likely to maintain as many features of classical logic as feasible. Fuzzy logic is based on data processing methodology that is extremely suitable when seeking to form indefinite information and to formulate coherent judgments in an uncertain environment. The fuzzy expert system is based on three walks. In the first walk, the non-fuzzy set is

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