

USABILITY IMPROVEMENT FOR A CAR RETRIEVAL SYSTEM EMPLOYING THE IMPORTANT DEGREES OF FUZZY GRADES

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ABSTRACT. *This paper proposes a fuzzy information retrieval system for purchasing cars which employs the important degrees. This system aims to support such persons who are not good with machines or cars. When they try to purchase a car, they can use this system easily as if they ask casually someone else who know more about car. Unspecific conditions are expressed by fuzzy sets, and the level matching conditions are expressed by grade values. To use this more practically, a GUI form with selection menus has been developed. In conclusion, reviews and observation of this study show its effectiveness, remaining issues, and measures for the issues.*

Keywords: Fuzzy set, Car retrieval system, Purchase support

1. **Introduction.** As car-oriented society has grown these days, the number of cars owned by one household is increasing. Especially in rural areas, it is even no longer one car per a household, it is one car per person. Meanwhile, many car makers provide variety of unique cars suit for individuals. It is easy for people to choose car type, especially for those who have special interest in cars. However, as for opposites, they don't really care about car type, etc., so it's relatively difficult for them to choose cars that suit them most. Under these circumstances, a car retrieval system is developed to support the decision making. In the usual information retrieval model, vector space model [1] has been proposed, but the keywords to be input to this model must be clear and specific, thus, even a little incorrect keywords will never reach to the target information. Given this, by using fuzzy sets [2] [3], this study aims at developing a practical system which enables searching by using everyday words like a car with "slightly small" or "big" for *Engine displacement*. In addition a GUI form is made to help developing more general and practical system and to improve its usability.

2. Fuzzy Information Retrieval System.

2.1. **GUI form and the important degrees.** Figure 1 shows the proposed GUI form. We adopted slider bars which indicate the important degree of each item. Users can select any items in which they are particularly interested, and items they think it's important and so on. Here are the details of this form:

- (a) *Price*: The crisp set is used, ranging from 1 million yen to 10 million yen at interval of 0.5 million yen.
- (b) *Car size, Engine displacement, Maximum power*: Five triangle membership functions are adopted (Figure 2(a)(b)(c)). *Car size* indicates the (length)*(width) of the car, and a factor of height is used for *Good visibility*.