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A computational approach to fuzzy quantifiers in natural languages â˜†

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Abstract

The generic term *fuzzy quantifier* is employed in this paper to denote the collection of quantifiers in natural languages whose representative elements are: *several, most, much, not many, very many, not very many, few, quite a few, large number, small number, close to five, approximately ten, frequently*, etc. In our approach, such quantifiers are treated as fuzzy numbers which may be manipulated through the use of fuzzy arithmetic and, more generally, fuzzy logic.

A concept which plays an essential role in the treatment of fuzzy quantifiers is that of the cardinality of a fuzzy set. Through the use of this concept, the meaning of a proposition containing one or more fuzzy quantifiers may be represented as a system of elastic constraints whose domain is a collection of fuzzy relations in a relational database. This

representation, then, provides a basis for inference from premises which contain fuzzy quantifiers. For example, from the propositions â€œMost U's are A'sâ€ and â€œMost A's are B's,â€ it follows that â€œMost^2 U's are B's,â€ where $most^2$ is the fuzzy product of the fuzzy proportion $most$ with itself.

The computational approach to fuzzy quantifiers which is described in this paper may be viewed as a derivative of fuzzy logic and test-score semantics. In this semantics, the meaning of a semantic entity is represented as a procedure which tests, scores and aggregates the elastic constraints which are induced by the entity in question.

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