

Abstract:

It has been claimed, especially in the engineering literatures, that the quantification of uncertainty by probability is unsatisfactory, if not inadequate. A consequence has been the development of alternatives to probability, one of which is *possibility theory*.

In this talk, based on my paper with Jane Booker in *The Journal of the American Statistical Association*, I start with an overview of fuzzy sets and point out a limitation of the mathematical theory of probability for endowing probability measures to fuzzy sets. I then propose an approach which overcomes these limitations. The approach is based on a use of La Place's genie for interpreting probability and a use of the statistical notion of the likelihood function to operationalize, via Bayes' Theorem, the assignment of finitely additive probability measures to fuzzy sets.

The conclusion of my talk is that alternatives to probability are unnecessary, especially in the context of fuzzy sets. I do not advocate the need for fuzzy sets (and their associated membership functions), but take them on face value as useful linguistic constructs that could be germane to computer scientists for natural language processing.