Halpern, Joseph Y.; **Fagin, Ronald**
Two views of belief: Belief as generalized probability and belief as evidence. (English)
Zbl 0762.68055
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Summary: Belief functions are mathematical objects defined to satisfy three axioms that look somewhat similar to the Kolmogorov axioms defining probability functions. We argue that there are (at least) two useful and quite different ways of understanding belief functions. The first is as a generalized probability function (which technically corresponds to the inner measure induced by a probability function). The second is as a way of representing evidence. Evidence, in turn, can be understood as a mapping from probability functions to probability functions. It makes sense to think of updating a belief if we think of it as a generalized probability. On the other hand, it makes sense to combine two beliefs (using, say, Dempster's rule of combination) only if we think of the belief functions as representing evidence. Many previous papers have pointed out problems with the belief function approach; the claim of the paper is that these problems can be explained as a consequence of confounding these two views of belief functions.

Reviewer: Reviewer (Berlin)

MSC:

68T15   Theorem proving (deduction, resolution, etc.) (MSC2010)

Cited in **40** Documents

Keywords:

Belief functions; generalized probability; evidence; updating; combination

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