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The Goodman-Nguyen relation within imprecise probability theory. (English) Zbl 1433.60002
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Summary: The Goodman-Nguyen relation is a partial order generalising the implication (inclusion) relation to conditional events. As such, with precise probabilities it both induces an agreeing probability ordering and is a key tool in a certain common extension problem. Most previous work involving this relation is concerned with either conditional event algebras or precise probabilities. We investigate here its role within imprecise probability theory, first in the framework of conditional events and then proposing a generalisation of the Goodman-Nguyen relation to conditional gambles. It turns out that this relation induces an agreeing ordering on coherent or C-convex conditional imprecise previsions. In a standard inferential problem with conditional events, it lets us determine the natural extension, as well as an upper extension. With conditional gambles, it is useful in deriving a number of inferential inequalities.

MSC:

60A05 Axioms; other general questions in probability
60A86 Fuzzy probability

Cited in 7 Documents

Keywords:

Goodman-Nguyen relation; imprecise probabilities; imprecise previsions; natural extension

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