Quantum Decision Theory

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Abstract

We argue that, contrary to conventional wisdom, decision theory is not invariant to the physical environment in which a decision is made. Specifically, we show that a decision maker (DM) with access to quantum information resources may be able to do strictly better than a DM with access only to classical information resources. In this respect, our findings are somewhat akin to those in computer science that have established the superiority of quantum over classical algorithms for certain problems. We treat three kinds of decision tree: (i) Kuhn trees ([24, 1950], [25, 1953]) in which the DM has perfect recall; (ii) Kuhn trees in which the DM has imperfect recall; and (iii) non-Kuhn trees.

The full paper is available at http://arxiv.org/abs/1107.0237