

Rationality, intractability and the prospects of ‘as if’ explanations

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Abstract. Proponents of a probabilistic (Bayesian) turn in the study of human cognition have used the intractability of (non-monotonic) logics to argue against the feasibility of logicist characterizations of human rationality. It is known, however, that probabilistic computations are generally intractable as well. Bayesians have argued that, in their own case, this is merely a pseudoproblem. Their argument is that humans do not really perform the probabilistic calculations prescribed by probability theory, but only act as if they do—much like the planets do not calculate their own orbits, and birds fly without any knowledge of the theory of aerodynamics.

The prospects of such an ‘as if’ explanation dissolving the intractability problem depends inter alia on what is meant by ‘as if’. I analyze some of the most plausible meanings that are compatible with various statements in the literature, and argue that none of them circumvents the problem of intractability.

The analysis will show that, even though the constraints imposed by tractability may prove pivotal for determining adequate characterizations of human rationality, these constraints do not directly favor one type of formalism over another. Cognitive science would be better off realizing this and putting efforts into dealing with the problem of intractability head-on, rather than playing a shell game.

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