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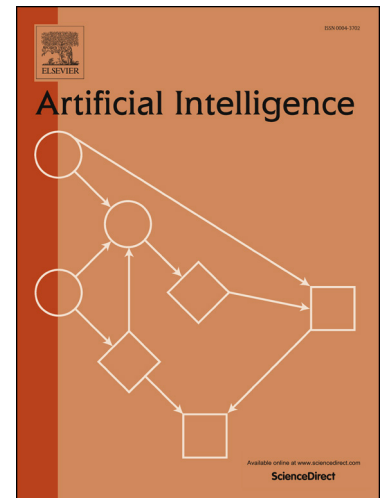
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Taking Account of the Actions of Others in Value-based Reasoning

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Abstract

Practical reasoning, reasoning about what actions should be chosen, is highly dependent both on the individual values of the agent concerned and on what others choose to do. Hitherto, computational models of value-based argumentation for practical reasoning have required assumptions to be made about the beliefs and preferences of other agents. Here we present a new method for taking the actions of others into account that does not require these assumptions: the only beliefs and preferences considered are those of the agent engaged in the reasoning. Our new formalism draws on utility-based approaches and expresses the reasoning in the form of arguments and objections, to enable full integration with value-based practical reasoning. We illustrate our approach by showing how value-based reasoning is modelled in two scenarios used in experimental economics, the Ultimatum Game and the Prisoner's Dilemma, and we present an evaluation of our approach in terms of these experiments. The evaluation demonstrates that our model is able to reproduce computationally the results of ethnographic experiments, serving as an encouraging validation exercise.¹

Keywords: Value-based Reasoning, Practical Reasoning, Expected Utility, Argumentation Schemes, Ultimatum Game, Prisoner's Dilemma

¹This article is a revised and extended version of [1], which was adjudged runner up for the best paper award at the Twenty Second European Conference on Artificial Intelligence (ECAI 2016). This article also incorporates some material based on [2].

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