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An overview of algorithmic approaches to compute optimum entropy distributions in the expert system shell MECore (extended version). (English) Zbl 1436.68341

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Summary: The expert system shell MECore provides a series of knowledge management operations to define probabilistic knowledge bases and to reason under uncertainty. To provide a reference work for MECore algorithmics, we bring together results from different sources that have been applied in MECore and explain their intuitive ideas. Additionally, we report on our ongoing work regarding further development of MECore's algorithms to compute optimum entropy distributions and provide some empirical results. Altogether this paper explains the intuition of important theoretical results and their practical implications, compares old and new algorithmic approaches and points out their benefits as well as possible limitations and pitfalls.

MSC:

68T35 Theory of languages and software systems (knowledge-based systems, expert systems, etc.) for artificial intelligence
60E05 Probability distributions: general theory
68T30 Knowledge representation

Keywords:

probabilistic reasoning; probabilistic conditional logic; maximum entropy; uncertain reasoning

Software:

L-BFGS; SPIRIT

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