

Research project proposal – Project title

Representations of logical structures and their application in computer science and artificial intelligence

Background (max 500 characters)

The problem of reasoning with uncertain knowledge is an ancient problem dating from Leibnitz and Boole. In the last decades there is a growing interest in the field connected with applications to computer science and artificial intelligence. Researchers from those areas have studied uncertain reasoning using different tools. Some of the proposed formalisms for representing, and reasoning with, uncertain knowledge are based on probabilistic logics in which one is able to make statements of the form $P_{\geq s}\alpha$ with the intended meaning "the probability of α is at least s ".

Project description (max 750 karaktera)

Our research is focused on:

- knowledge representation, particularly development of strongly complete axiom systems for fields relevant to CS and AI (e.g. uncertain, temporal, non-monotonic reasoning),
- applications of those formal systems to real-world problems (e.g. expert systems, decision support systems),
- development of complete and semi-complete satisfiability checkers for the above mentioned formal systems.

References (max 5)

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3. D. Jovanović, N. Mladenović, Z. Ognjanović, Variable Neighborhood Search for the Probabilistic Satisfiability Problem, in: Metaheuristics: Progress in Complex Systems Optimization, Springer Series: Operations Research/Computer Science Interfaces Series, Vol. 39, Doerner, K.F.; Gendreau, M.; Greistorfer, P.; Gutjahr, W.; Hartl, R.F.; Reimann, M. (Eds.), Springer, Berlin-NY, 173-188, 2007.
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5. D. Doder, J. Grant, Z. Ognjanović, Probabilistic logics for objects located in space and time, Journal of Logic and Computation 23(3), 487-515, 2013.

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