

This research line has resulted in the development of a logic programming language, Possibilistic Defeasible Logic Programming (P-DeLP), an extension of DeLP that allows the treatment of possibilistic uncertainty and fuzzy knowledge at object-language level. This research line has been developed in collaboration with the University of Lleida (Spain) and Artificial Intelligence Research Institute (Spain). In P-DeLP, knowledge representation features are formalized based on PGL, a possibilistic logic based on the Horn-rule fragment of Gödel fuzzy logic. In PGL formulas are built over fuzzy propositional variables and the certainty degree of formulas is expressed with a necessity measure. In a logic programming setting, the proof method for PGL is based on a complete calculus for determining the maximum degree of possibilistic entailment of a fuzzy goal. In a multiagent context, we have studied how agents can use P-DeLP to encode their knowledge about the world, using the argument and warrant computing procedure to perform their inferences. In particular, we have also formalized and studied a number of argument-based consequence operators which allow to model different aspects of the reasoning abilities in an intelligent agent. We have also analyzed how answers to P-DeLP queries can be speeded up by pruning the associated search space.

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A Logic Programming Framework for Possibilistic Argumentation with Vague Knowledge. C. Chesñevar and G. Simari and T. Alsinet and L. Godo, Proc. Intl. Conf. in Uncertainty in Artificial Intelligence (UAI 2004). Banff, Canada, pp. 76-84.