

Best possible answer is computable for fuzzy SLD-resolution *

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Summary. This is a direct continuation of a joint work with P. Vojtáš in which we proved soundness and completeness of fuzzy SLD-resolution for arbitrary many-valued logic with two continuous conjunctions. Using this result here we prove that the maximal value of grade for a fuzzy answer is attained during fuzzy SLD-resolution in logic with only one continuous conjunction. Based on this result we prove better characterization of the least fuzzy Herbrand model of fuzzy definite logic program, which allows us to give a refinement of the completeness part.

1. Introduction

In [12] authors (P. Vojtáš and L. Paulík) consider theoretical (mathematical) model of extended logic programming in many valued logic with arbitrary triple of connectives (seq, et_1 , et_2), where et_1 evaluates modus ponens containing the implication seq, and et_2 is the conjunction from bodies of clauses. Declarative semantics is based on generalization of P. Hájek's RPL and RQL. Let us make several remarks concerning these logics in more general way.

It is worth mentioning here, that well-known non-classical logics was proposed by Łukasiewicz and Gödel and that main interest was payed on 1-tautologies in these logics. J. Pavelka made further development of Łukasiewicz logic on propositional level ([10]). He considered not only single formula φ but also a numerical value r (grade) connected with the formula and proposed deduction calculus for maintaining graded formulas ($\varphi; r$) meaning truth value of φ is at least r . He introduced notion of graded proof and norma $|\varphi|_T$ means the supremum of values for graded proof of φ from a theory T . Norma $\|\varphi\|_T$ means the infimum of values which formula φ gets in models of T . J. Pavelka proved completeness theorem of the form $|\varphi|_T = \|\varphi\|_T$. Further development of Pavelka's ideas was done by V. Novák on predicate level [9]. Substantial simplification of these logics was achieved in P. Hájek's RPL and RQL, see [3],[5].

Recently P. Hájek and D. Švejda in [7] proved strong completeness for finitely axiomatized theory in Łukasiewicz logic and as a consequence also

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