

Anahit Chubaryan, Artur Khamisyan*

On the proof complexity in two universal proof system for all versions of many-valued logics

Two types of universal propositional proof systems were described in [1] such that propositional proof system for every version of MVL can be presented in both of described forms. The first of introduced systems (US) is a Gentzen-like system, the second one (UE) is based on the generalization of the notion of determinative disjunctive normal form, defined by first coauthor for two-valued logic [2]. The last type proof systems are weak ones with a simple strategist of proof search and we have investigated the quantitative properties, related to proof complexity characteristics in them. In particular, for some class of many-valued tautologies simultaneously optimal bounds (asymptotically the same upper and lower bounds) for each of main proof complexity characteristics (size, steps, space and width) were obtained in the second-type systems, considered for some versions of many-valued logic. Now we investigate the relations between the main proof complexity measures in both universal systems. We prove that the system UE p -simulates the system US, but the system US does not p -simulate the system UE and therefore the systems UE and US do not be p -equivalent, but nevertheless some classes of k -tautologies have the same proof complexities bounds in both systems, hence we obtain similar results in Gentzen-like system for the same and for other classes of many-valued tautologies as well.

This work was supported by the RA MES State Committee of Science, in the frames of the research project Nr. 18T-1B034.

Bibliography

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