

- ▶ ANAHIT CHUBARYAN, ARTUR KHAMISYAN, *On the proof complexity in two universal proof system for all versions of many-valued logics.*

Department of Informatics and Applied Mathematics, Yerevan State University, 1 Alex Manoogian, Armenia.

*E-mail:* achubaryan@ysu.am, Artur.Khamisyan@gmail.com.

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.

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[1] AN. CHUBARYAN, A. KHAMISYAN, *Two types of universal proof systems for all variants of many-valued logics and some properties of them*, **Iran Journal of Computer Science**, 2018, Springer Verlag, <https://doi.org/10.1007/s42044-018-0015-4>.

[2] AN.CHUBARYAN, *Relative efficiency of some proof systems for classical propositional logic*, **Proceedings of NASA RA**, vol.37,N5,2002, and Journal of CMA (AAS),Vol.37, N5, 71-84.

[3] A.CHUBARYAN, A.TSHITOYAN, A.KHAMISYAN, *On some proof systems for many-valued logics and on proof complexities in it, (in Russian)*, **National Academy of Sciences of Armenia, Reports**, vol.116, N2, 2016, 108-114.