On a new problem of complexity theory arising from Galois–Tukey connections

Peter Vojtáš[1]

peter.vojtas@matfyz.cuni.cz

In [2] we have introduced a formalism which extracted ideas in many proofs of inequalities between cardinal characteristics of continuum. Andreas Blass in [1] observed that the formalism is categorical and present also in complexity theory.

Here we build on this understanding of complexity problems. To make the Blass' category fully viable we need to correctly extend the range of responses by an element "nar = no acceptable response". That is, an algorithm solving e.g. $3\mathrm{SAT}^{nar}$ search problem has to halt also on unsatisfiable formulas with correct answer "nar".

Question. Find a place of $3\mathrm{SAT}^{nar}$ problem in the hierarchy of computational complexity problems.

[1] A. Blass, *Questions and Answers. A Category Arising in Linear Logic, Complexity Theory, and Set Theory*, Advances in Linear Logic, Girard, JY. et al eds., (1995), pp. 61–81.

[2] P. Vojtas, *Generalized galois-tukey-connections between explicit relations on classical objects of real analysis*, Israel Math. Conf. Proc., 6 (1993), pp. 619–643.

[1]The author was supported by Dpt. Software Engineering, Charles University