An ω-categorical cheese platter for finite-domain Promise Constraint Satisfaction Problems

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Abstract

The Bodirsky-Pinsker dichotomy conjecture is of central importance in the field of infinite-domain Constraint Satisfaction Problems (CSPs). It extends the finite-domain complexity dichotomy confirmed by Bulatov and Zhuk to a certain class of well-behaved infinite templates.

We demonstrate that every non-trivially tractable infinite template within the scope of the Bodirsky-Pinsker conjecture can be transformed into a witness for the tractability of a finite-domain Promise Constraint Satisfaction Problem (PCSP) that is not finitely tractable. Specifically, we show that, up to a Datalog-reduction, it serves as such a witness via the so-called sandwich method. This result strengthens a novel connection between the Bodirsky-Pinsker conjecture and finite-domain PCSPs.