Title

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December 17, 2025

Status 0.0.1 — Status

This is a review of [1], which gives an open question that relates to the literature I have been reviewing for my unique games tproblem

Contents

1   Summary of [1]

This paper aims to study the parameterized complexity of local search parameterized by constraint differnce.

1.1   Definitions and preliminaries

Definition 1.1.1 — Boolean Relation

For an integer $r \in \mathbb{N}^+$, a *boolean relation* R is a subset of $\mathbb{F}_2^r$, where the integer r is called the *arity* of R.

For a boolean relation R of arity r and $b \in \mathbb{F}_2^r$, define the boolean relation $R \oplus b := \{\alpha \oplus b \mid \alpha \in R\}$, where $\oplus$ is the addition operator over $\mathbb{F}_2^r$. When considering R ias a clause in a CSP instance, $\oplus$ operator can be seen as variable negations. For a relation R with index $[r]$ and $S \subseteq [r]$, define the projection relation $\pi_s(R) = \{\alpha \mid \alpha \in R\}$, where α_S means extracting the value on coordinates in S.

References

[1] Aditya Anand, Vincent Cohen-Addad, Tommaso d'Orsi, Anupam Gupta, Euiwoong Lee, Debmalya Panigrahi, and Sijin Peng. Complexity of local search for csps parameterized by constraint difference, 2025.