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Understanding the potential of propagators. (English) [Zbl 06605772](#)

Michel, Laurent (ed.), Integration of AI and OR techniques in constraint programming. 12th international conference, CPAIOR 2015, Barcelona, Spain, May 18–22, 2015. Proceedings. Cham: Springer (ISBN 978-3-319-18007-6/pbk; 978-3-319-18008-3/ebook). Lecture Notes in Computer Science 9075, 427-436 (2015).

Summary: Propagation is at the very core of constraint programming (CP): it can provide significant performance boosts as long as the search space reduction is not outweighed by the cost for running the propagators. A lot of research effort in the CP community is directed toward improving this trade-off, which for a given type of filtering amounts to reducing the computation cost. This is done chiefly by 1) devising more efficient algorithms or by 2) using on-line control policies to limit the propagator activations. In both cases, obtaining improvements is a long and demanding process with uncertain outcome. We propose a method to assess the potential gain of both approaches before actually starting the endeavor, providing the community with a tool to best direct the research efforts. Our approach is based on instrumenting the constraint solver to collect statistics, and we rely on replaying search trees to obtain more realistic assessments. The overall approach is easy to setup and is showcased on the energetic reasoning (ER) and the revisited cardinality reasoning for BinPacking (RCRB) propagators.

For the entire collection see [\[Zbl 1337.68015\]](#).

MSC:

[68T20](#) Problem solving in the context of artificial intelligence (heuristics, search strategies, etc.)
[90C27](#) Combinatorial optimization

Keywords:

[constraint programming](#); [propagator](#); [analysis](#); [energetic reasoning](#); [BinPacking](#)

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