

Non-Clausal Reasoning

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Abstract

State of the art SAT solvers typically solve SAT theories encoded into CNF using DPLL based algorithms. Most problems, however, are not originally expressed in CNF but contain arbitrary propositional formulae. The original problem must therefore be converted into CNF. Converting to a simple and uniform structure like CNF provides conceptual and implementational simplicity. Indeed, a number of key techniques that improve the effectiveness and efficiency of DPLL solvers exploit the simple clause structure. However, converting to CNF loses a considerable amount of information about the problem's structure. This is information that could be used to improve the search efficiency. I will discuss how a SAT solver can be implemented to reasoning efficiently with non-clausal formulae, and where computational advantages can be gained.

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