

# dynQBF: A Dynamic Programming-based QBF Solver

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<http://dbai.tuwien.ac.at/proj/decodyn/dynqbf>

**Abstract.** The software tool dynQBF is a structure-aware QBF solver. It handles QBF instances in prenex CNF format, and supports QSAT (deciding satisfiability of QBFs) as well as enumerating solutions (partial certificates for the outermost quantifier block). In a nutshell, dynQBF splits the QBF instance into subproblems by constructing a so-called tree decomposition. The QBF is then solved by dynamic programming over the tree decomposition. As key ingredient, dynQBF uses Binary Decision Diagrams (provided by the CUDD library) to efficiently store intermediate results.

dynQBF is at an early stage of development. Still, it gives promising results for instances with few quantifier alternations and where the treewidth of the propositional formula does not exceed 50. Treewidth is a measurement for the structure of the given input. The concepts underlying dynQBF try to exploit this structural parameter, such that its runtime tends to be low for instances of small treewidth, despite a (potentially) large input formula.