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BiqCrunch: a semidefinite-based solver for binary quadratic problems

BiqCrunch is a new branch-and-bound solver for finding exact solutions of any 0-1 quadratic problem, such as Max-Cut, Max- k -cluster, and Max-independent set. The bounds are based on a regularized semidefinite relaxation and are efficiently computable using eigenvalue decomposition and a quasi-Newton optimization method. The resulting semidefinite bounding procedure gives us a competitive branch-and-bound algorithm for solving many such combinatorial optimization problems to optimality.