QP Diving

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Abstract: This talk is concerned with branch and bound methods for the solution of convex mixed-integer quadratic programs (MIQPs). We propose a quadratic programming (QP) based branch and bound method referred to as *QP diving*. Here, the key idea is to very quickly solve a sequence of related QPs while descending a branch of the tree. We argue that this can be done favorably by exploiting the hot starting capabilities of parametric active-set methods for quadratic programming. We address details of the arising quadratic subproblems and discuss numerical and implementation issues of hot starting. Combined with an active-set based sequential quadratic programming (SQP) method, the algorithm can be extended to tackle convex mixed-integer nonlinear programs (MINLPs). Computational evidence of the efficacy of QP diving on a set of select MINLP instances is given.

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