Partly Convex and Convex-Monotonic Optimization Problems

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Abstract: A large class of nonconvex optimization problems encountered in the applications exhibit a hybrid structure combining partial convexity with partial monotonicity. We discuss a decomposition scheme for solving this class of problems. By exploiting both partial convexity and partial monotonicity a branch and bound scheme is proposed with branching performed on the nonconvex variables and bounds computed by Lagrange or convex relaxation. Conditions that guarantee convergence of such branch and bound algorithms are given. Incidentally several incorrect results in the recent literature on related subjects are reviewed.

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