

Derivative-free trust-region algorithms for constrained minimization

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In this work, we propose a trust-region algorithm for the problem of minimizing a function within a convex closed domain. We assume that the objective function is differentiable but its derivatives are unavailable. The algorithm has a very simple structure and allows a great deal of freedom in the choice of the quadratic models. Under reasonable assumptions for derivative-free schemes, we prove global convergence for the algorithm, that is to say, that all accumulation points of the sequence generated by the algorithm are stationary. We also present a derivative-free trust-region algorithm for general constrained problems and a comparison in terms of numerical performance with other approaches from the literature.