

Solving Difficult Nonlinear Programs Using Penalty Methods

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Abstract: We are concerned with the solution of nonlinear optimization problems that, until recently, were out of reach of modern algorithms and software. We have in mind problems that do not satisfy standard constraint qualifications or for which a “weak constraint formulation” is preferred. In this talk we propose new active-set and interior-point methods that use an exact penalty function approach to regularize the constraints. Particular emphasis is given to the solution of large problems. Numerical results will be presented for applications arising in circuit design, economics and PDE-constrained optimization.

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