

ALTERNATIVE PARAMETER CHOICES FOR MULTI-STEP QUASI-NEWTON METHODS

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Dedicated to Professor Charles Broyden
on the occasion of his sixtieth birthday

Abstract

In a previous paper, Ford and Moghrabi [7] introduced a new, generalized approach to quasi-Newton methods, based on employing interpolatory polynomials which utilize information from the m most recent steps (where standard quasi-Newton methods correspond to $m = 1$, working only with the most recent step). In these new methods, the iterates were interpolated by a curve in such a way that consecutive points corresponded to a unit-spacing of the parameter defining the curve. In this paper we derive and evaluate some alternative choices for defining the parameter-values which correspond to the iterates on the curve. The experimental results show clearly that such methods can give substantial gains in performance (by comparison with the "unit-spaced" method, which itself yields improvements over standard quasi-Newton methods).

Keywords: Unconstrained optimization, quasi-Newton methods

