

Ralph, Daniel**Global convergence of damped Newton's method for nonsmooth equations via the path search.** (English) [Zbl 0819.90102](#)

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Summary: A natural damping of Newton's method for nonsmooth equations is presented. This damping, via the path search instead of the traditional line search, enlarges the domain of convergence of Newton's method and therefore is said to be globally convergent. Convergence behavior is like that of line search damped Newton's method for smooth equations, including Q -quadratic convergence rates under appropriate conditions.

Applications of the path search include damping Robinson-Newton's method for non-smooth normal equations corresponding to nonlinear complementarity problems and variational inequalities, hence damping both Wilson's method (sequential quadratic programming) for nonlinear programming and Josephy-Newton's method for generalized equations.

Computational examples from nonlinear programming are given.

MSC:[90C30](#) Nonlinear programming[49M15](#) Newton-type methods[90C33](#) Complementarity and equilibrium problems and variational inequalities (finite dimensions) (aspects of mathematical programming)Cited in **34** Documents**Keywords:**

damping of Newton's method; nonsmooth equations; path search

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