1067-49-775 **Hung Phan*** (pmhung@wayne.edu), 5200 Anthony Wayne Drive, #505, Detroit, MI 48202. *A Generalized Newton's Method based on Graphical Derivatives.*

This paper concerns developing a numerical method of the Newton type to solve systems of nonlinear equations described by nonsmooth continuous functions. We propose and justify a new generalized Newton algorithm based on graphical derivatives, which have never been used to derive a Newton-type method for solving nonsmooth equations. Based on advanced techniques of variational analysis and generalized differentiation, we establish the well-posedness of the algorithm, its local superlinear convergence, and its global convergence of the Kantorovich type. Our convergence results hold with no semismoothness assumption, which is illustrated by examples. The algorithm and main results obtained in the paper are compared with well-recognized semismooth and B-differentiable versions of Newton's method for nonsmooth Lipschitzian equations. (Received September 14, 2010)