Some Efficient Higher Order Iterative Schemes for Solving Nonlinear Systems

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Abstract : In this article, two classes of iterative schemes are proposed for approximating solutions of nonlinear systems of equations whose orders of convergence are six and eight respectively. Sixth order scheme requires the evaluation of two vector-functions, two first Fr'echet derivatives and three matrices inversion per iteration. This three-step sixth-order method is further extended to eighth-order method which requires one more step and the evaluation of one extra vector-function. Moreover, computational efficiency is compared with some other recently published methods in which we found, our methods are more efficient than existing numerical methods for higher and medium size nonlinear system of equations. Numerical tests are performed to validate the proposed schemes.