

Newton-SOR with quadrature scheme for solving nonlinear fredholm integral equations

ABSTRACT

This paper presents a numerical method of Newton Successive Over- Relaxation (NSOR) iteration with quadrature scheme to approximate the solution of nonlinear Fredholm integral equations. Here, the quadrature scheme is used to derive the approximation equations of nonlinear Fredholm integral equations in order to develop a system of nonlinear equations. NSOR consists of two parts. In the first part, Newton's method is used to linearize the developed system of nonlinear equations. Then, in the second part, SOR iteration is used to solve the corresponding system of linear equations to get the approximate solution. In order to validate the performance of the proposed method, Newton-Jacobi (NJacobi) and Newton-Gauss-Seidel (NGS) are used as the reference methods to perform the comparative analysis. Also, some numerical examples are presented to illustrate the validity of the NSOR.