1145-34-1445 **Aghalaya S. Vatsala*** (`vatsala@louisiana.edu`), Department of Mathematics, University of Louisiana at Lafayette, Lafayette, LA 70504, and **M Sowmya**. *Mixed Generalized Iterative Method For Nonlinear Problems.* Preliminary report.

Nonlinear problems arise naturally in the mathematical modeling of physical situation in various branches of science and engineering. Explicit computation of solutions of these nonlinear problems is rarely possible. Generalized monotone method combined with coupled lower and upper solutions provides the existence of coupled minimal and maximal solutions. The method is useful, when the nonlinear function is the sum of an increasing and decreasing functions. On the other hand, generalized quasilinearization method is applicable when the nonlinear function is the sum of a convex and concave functions. In this work, we mix the two methods together with coupled lower and upper solutions when the nonlinear function, is any combination of an increasing, decreasing, convex and concave functions. The rate of convergence is super linear. The method can be easily extended to Caputo fractional differential equation with initial condition. The mixed iterative method is useful in Volterra integro- differential equations. For example, such equations arise in Hodgkin-Huxley model, FitzHugh Nagumo equation. A numerical example will be presented. (Received September 21, 2018)

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