1135-34-1357 **Vincenzo Michael Isaia*** (vincenzo.isaia@indstate.edu), Dept. of Mathematics and Computer Science, Terre Haute, IN 47809. *Simple Simulation of Nonlinear Differential Equations with (Fairly) General Deviating Arguments.* Preliminary report.

A simple approach (well suited for modelers, scientists and engineers) for the numerical simulation of DEs in a single independent variable with deviating arguments will be presented. Key features besides simplicity: user controlled order, approximation is a continuous function on its domain, discontinuities are not integrated over and don't pose difficulties, the same method applies to retarded, neutral and advanced equations, freedom from root finding techniques and convergence results are readily obtained. The method is applicable to stiff equations as well.

The types of deviating arguments (which are assumed to be delays) include, nonlinear in time, non-monotone in time, state dependent (including the possibility of dependence on derivatives of the state), and distributed (in the form of integration with respect to a kernel). Initial history may be non-analytic, but the delay/kernel should be analytic with respect to time. Although not to be presented here, the method extends to the PDE case as well. (Received September 21, 2017)