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Kuppalapalle Vajravelu* (kuppalapalle.vajravelu@ucf.edu), Department of Mathematics, University of Central Florida, 4393 Andromeda Loop N, Orlando, FL 32816. *Optimal analytical method for nonlinear differential equations arising in science and engineering*. Preliminary report.

The optimal homotopy analysis method (OHAM) for the solution of a nonlinear differential equation arising in science and engineering will be presented. Also, the method will be used to solve coupled nonlinear differential equations. In order to obtain accurate approximate analytical solutions, multiple auxiliary linear operators will be considered which permit accuracy with relatively few terms. The convergence control parameters will be selected through the construction of an optimal control problem for the minimization of the accumulated residual errors. Furthermore, open questions related to OHAM will be discussed. (Received June 07, 2017)