PARAMETER IDENTIFICATION BY GENERALISED SECANT METHOD

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Parameter identification problems can generally be formulated as non-linear least squares problems so that some unknown model parameters are determined providing minimal deviation between observed and simulated system responses. Solving non-linear least squares problems is often a difficult task especially if the number of unknowns are high. An efficient secant-method based algorithm is given which showed good stability and convergence properties even with relatively high number of unknowns and large system response deviations. The properties of the proposed method is demonstrated through a numerical problem. References are made to practical problems for which successful applications were made. The effect of parameter perturbation sensitivity on the convergence and on the stability of the proposed method was also studied by multi-dimensional parameter perturbation sensitivity analysis.