

**APPLICATIONS OF ITERATIVE NON-DIFFERENTIABLE OPTIMIZATION TO SOME ENGINEERING
APPROXIMATION PROBLEMS**

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Abstract: The data fitting problem, that is, the problem of approximating a function of several variables, given by tabulated data, and the corresponding problem for inconsistent (overdetermined) systems of linear algebraic equations are considered. Such problems, connected with measurement of physical quantities, arise, for example, in engineering, physics, etc. A traditional approach for solving these two problems is the discrete least squares data fitting method. In this paper, an alternative approach is proposed: with each of these problems, we associate a nondifferentiable (nonsmooth) unconstrained minimization problem with an objective function, based on discrete absolute deviation norm and/or uniform norm (sup-norm), respectively, that is, the problems under consideration are solved by minimizing the residual using these two norms. Respective subgradients are calculated, and a subgradient method is used for solving these two problems. The emphasis is on implementation of the proposed approach. Some computational results, obtained by an appropriate iterative method, are presented, and these results are compared with the results, obtained by the iterative gradient method for the corresponding "differentiable" least squares problems.