

Optimization software guide

More, Jorge J., author

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Abstrak

Developments in optimization theory, including emphasis on large problems and on interior-point methods for linear programming, have begun to appear in production software. Here is a reference tool that includes discussions of these areas and names software packages that incorporate the results of theoretical research. After an introduction to the major problem areas in optimization and an outline of the algorithms used to solve them, a data sheet is presented for each of the 75 software packages and libraries in the authors' survey. These include information on the capabilities of the packages, how to obtain them, and addresses for further information.

Standard optimization paradigms are addressed -- linear, quadratic, and nonlinear programming; network optimization; unconstrained and bound-constrained optimization; least-squares problems; nonlinear equations; and integer programming. The most practical algorithms for the major fields of numerical optimization are outlined, and the software packages in which they are implemented are described. This format will aid current and potential users of optimization software in classifying the optimization problem to be solved, determining appropriate algorithms, and obtaining the software that implements those algorithms. Readers need only a basic knowledge of vector calculus and linear algebra to understand this book.