
Description: COMPREHENSIVE COVERAGE OF NONLINEAR PROGRAMMING THEORY AND ALGORITHMS, THOROUGHLY REVISED AND EXPANDED

Nonlinear Programming: Theory and Algorithms—now in an extensively updated Third Edition—addresses the problem of optimizing an objective function in the presence of equality and inequality constraints. Many realistic problems cannot be adequately represented as a linear program owing to the nature of the nonlinearity of the objective function and/or the nonlinearity of any constraints. The Third Edition begins with a general introduction to nonlinear programming with illustrative examples and guidelines for model construction.

Concentration on the three major parts of nonlinear programming is provided:
- Convex analysis with discussion of topological properties of convex sets, separation and support of convex sets, polyhedral sets, extreme points and extreme directions of polyhedral sets, and linear programming
- Optimality conditions and duality with coverage of the nature, interpretation, and value of the classical Fritz John (FJ) and the Karush-Kuhn-Tucker (KKT) optimality conditions; the interrelationships between various proposed constraint qualifications; and Lagrangian duality and saddle point optimality conditions
- Algorithms and their convergence, with a presentation of algorithms for solving both unconstrained and constrained nonlinear programming problems

Important features of the Third Edition include:
- New topics such as second interior point methods, nonconvex optimization, nondifferentiable optimization, and more
- Updated discussion and new applications in each chapter
- Detailed numerical examples and graphical illustrations
- Essential coverage of modeling and formulating nonlinear programs
- Simple numerical problems
- Advanced theoretical exercises

The book is a solid reference for professionals as well as a useful text for students in the fields of operations research, management science, industrial engineering, applied mathematics, and also in engineering disciplines that deal with analytical optimization techniques. The logical and self-contained format uniquely covers nonlinear programming techniques with a great depth of information and an abundance of valuable examples and illustrations that showcase the most current advances in nonlinear problems.

Contents:

Chapter 1 Introduction.
1.1 Problem Statement and Basic Definitions.
1.2 Illustrative Examples.
1.3 Guidelines for Model Construction.
Exercises.
Notes and References.
Part 1 Convex Analysis.
Chapter 2 Convex Sets.
2.1 Convex Hulls.
2.2 Closure and Interior of a Set.
2.3 Weierstrass's Theorem.
2.4 Separation and Support of Sets.
2.5 Convex Cones and Polarity.
2.6 Polyhedral Sets, Extreme Points, and Extreme Directions.
2.7 Linear Programming and the Simplex Method.

Exercises.

Notes and References.

Chapter 3 Convex Functions and Generalizations.
3.1 Definitions and Basic Properties.
3.2 Subgradients of Convex Functions.
3.3 Differentiable Convex Functions.
3.4 Minima and Maxima of Convex Functions.
3.5 Generalizations of Convex Functions.

Exercises.

Notes and References.

Part 2 Optimality Conditions and Duality.
Chapter 4 The Fritz John and Karush-Kuhn-Tucker Optimality Conditions.
4.1 Unconstrained Problems.
4.2 Problems Having Inequality Constraints.
4.3 Problems Having Inequality and Equality Constraints.
4.4 Second-Order Necessary and Sufficient Optimality Conditions for Constrained Problems.

Exercises.

Notes and References.

Chapter 5 Constraint Qualifications.
5.1 Cone of Tangents.
5.2 Other Constraint Qualifications.
5.3 Problems Having Inequality and Equality Constraints.

Exercises.

Notes and References.

Chapter 6 Lagrangian Duality and Saddle Point Optimality Conditions.
6.1 Lagrangian Dual Problem.
6.2 Duality Theorems and Saddle Point Optimality Conditions.
6.3 Properties of the Dual Function.
6.4 Formulating and Solving the Dual Problem
6.5 Getting the Primal Solution.
6.6 Linear and Quadratic Programs.

Exercises.

Notes and References.

Part 3 Algorithms and Their Convergence.

Chapter 7 The Concept of an Algorithm.
7.1 Algorithms and Algorithmic Maps.
7.2 Closed Maps and Convergence.
7.3 Composition of Mappings.
7.4 Comparison Among Algorithms.

Exercises.

Notes and References.

Chapter 8 Unconstrained Optimization.
8.1 Line Search Without Using Derivatives.
8.2 Line Search Using Derivatives.
8.3 Some Practical Line Search Methods.
8.4 Closedness of the Line Search Algorithmic Map.
8.5 Multidimensional Search Without Using Derivatives.
8.6 Multidimensional Search Using Derivatives.
8.7 Modification of Newton's Method: Levenberg-Marquardt and Trust Region Methods.
8.8 Methods Using Conjugate Directions: Quasi-Newton and Conjugate Gradient Methods.
8.9 Subgradient Optimization Methods.

Exercises.

Notes and References.

Chapter 9 Penalty and Barrier Functions.
9.1 Concept of Penalty Functions.
9.2 Exterior Penalty Function Methods.
9.3 Exact Absolute Value and Augmented Lagrangian Penalty Methods.
9.4 Barrier Function Methods.
9.5 Polynomial-Time Interior Point Algorithms for Linear Programming Based on a Barrier Function.

Exercises.

Notes and References.

Chapter 10 Methods of Feasible Directions.

10.1 Method of Zoutendijk.

10.2 Convergence Analysis of the Method of Zoutendijk.

10.3 Successive Linear Programming Approach.

10.4 Successive Quadratic Programming or Projected Lagrangian Approach.

10.5 Gradient Projection Method of Rosen.

10.6 Reduced Gradient Method of Wolfe and Generalized Reduced Gradient Method.

10.7 Convex-Simplex Method of Zangwill.

10.8 Effective First- and Second-Order Variants of the Reduced Gradient Method.

Exercises.

Notes and References.

Chapter 11 Linear Complementary Problem, and Quadratic, Separable, Fractional, and Geometric Programming.

11.1 Linear Complementary Problem.

11.2 Convex and Nonconvex Quadratic Programming: Global Optimization Approaches.

11.3 Separable Programming.

11.4 Linear Fractional Programming.

11.5 Geometric Programming.

Exercises.

Notes and References.

Appendix A Mathematical Review.

Appendix B Summary of Convexity, Optimality Conditions, and Duality.

Bibliography.

Index.
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