<<锥优化的基于核函数的内点算法>>

图书基本信息

书名：<<锥优化的基于核函数的内点算法>>

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前言

锥优化问题是一个凸规划问题，它的目标函数是线性函数，约束集是仿射空间和一个锥的交集，它从优化问题可行域的结构推广了线性规划问题，为求解非线性最优化问题提供了一种新的框架，锥优化有凸结构和丰富的对偶理论，对偶问题具有对称的简洁结构，同时，又有广泛应用背景，除了在传统学科，在经济、金融、管理和工程技术等领域亦有广泛的应用，近年来，锥优化与新兴学科有了广泛交叉和应用，如在无线传感网络、信息理论、编码理论等信息学科找到了丰富的应用，20世纪80年代出现的内点算法推动了算法计算复杂性研究的发展，也成为求解锥优化问题的强大工具，迄今为止，锥优化和内点算法已成为数学规划和优化领域最活跃的研究课题之一。

本书根据作者和其合作者Roos教授、Ghami博士、王国强博士近年来的研究工作，全面介绍求解线性规划、P（K）线性互补问题、半正定优化、二阶锥优化基于核函数的内点算法，核函数的重要性体现在它有简单的解析表达式、容易计算的高阶导数等良好性质。

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内容概要

本书根据作者和其合作者Roos教授、Ghami博士、王国强博士近年来的研究工作，全面介绍求解线性规划、P*(k)线性互补问题、半正定优化、二阶锥优化基于核函数的内点算法。
核函数的重要性体现在它有简单的解析表达式、容易计算的高阶导数等良好性质。
由核函数确定的障碍函数继承了这些良好性质，准确刻画了锥优化问题的中心路径，基于障碍函数设计的原始对偶内点算法，并有程序化的分析方法，使得内点算法的计算复杂性分析变得十分容易。

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章节摘录

A linear optimization problem is the minimization of a linear function over a polyhedral set which can be viewed as the intersection of an affine space and the coneof nonnegative orthant. Many problems can be formulated as, or approximated bya linear optimization problem. There are many versions of interior-point methodsfor linear optimization. But the basic scheme of these methods is to remove theconstraint set and add a multiple of the barrier function to the objective function.Therefore, the barrier-based scheme reduces the constrained problem into a seriesof unconstrained problems, then to "trace" the path formed by the optimal solutions of unconstrained problems. "Trace" means that the optimal solutions ofunconstrained problems can be replaced by a good enough approximation of theoptimal solutions of unconstrained problems. The procedure of the scheme canbe gone on with updating the barrier parameter until the optimal set of linearoptimization problem is reached.

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