Preface

Semidefinite programming (or SDP) has been one of the most exciting and active research areas in optimization during the 1990s. It has attracted researchers with very diverse backgrounds, including experts in convex programming, linear algebra, numerical optimization, combinatorial optimization, control theory, and statistics. This tremendous research activity was spurred by the discovery of important applications in combinatorial optimization and control theory, the development of efficient interior-point algorithms for solving SDP problems, and the depth and elegance of the underlying optimization theory.

This book includes nineteen chapters on the theory, algorithms, and applications of semidefinite programming. Written by the leading experts on the subject, it offers an advanced and broad overview of the current state of the field. The coverage is somewhat less comprehensive, and the overall level more advanced, than we had planned at the start of the project. In order to finish the book in a timely fashion, we have had to abandon hopes for separate chapters on some important topics (such as a discussion of SDP algorithms in the framework of general convex programming using the theory of self-concordant barriers, or an overview of numerical implementation aspects of interior-point methods for SDP). We apologize for any important gaps in the contents, and hope that the historical notes at the end of the book provide a useful guide to the literature on the topics that are not adequately covered in this handbook.

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