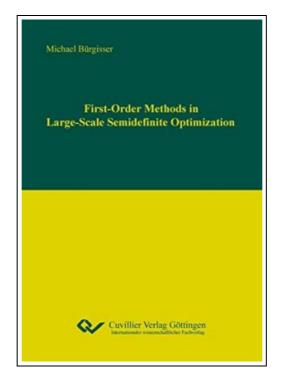
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Reviews

Simply no words to spell out. It can be rally fascinating throgh studying period of time. You will not really feel monotony at at any moment of your own time (that's what catalogues are for concerning if you ask me).

(Dr. Isabella Turner)

FIRST-ORDER METHODS IN LARGE-SCALE SEMIDEFINITE OPTIMIZATION



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Cuvillier Verlag Jun 2012, 2012. Taschenbuch. Book Condition: Neu. 211x149x5 mm. Neuware - Semidefinite Optimization has attracted the attention of many researchers over the last twenty years. It has nowadays a huge variety of applications in such different fields as Control, Structural Design, Statistics, or in the relaxation of hard combinatorial problems. In this thesis, we focus on the practical tractability of large-scale semidefinite optimization problems. From a theoretical point of view, these problems can be solved by polynomial-time Interior-Point methods approximately. The complexity estimate of Interior-Point methods grows logarithmically in the inverse of the solution accuracy, but with the order 3.5 in both the matrix size and the number of constraints. The later property prohibits the resolution of large-scale problems in practice. In this thesis, we present new approaches based on advanced First-Order methods such as Smoothing Techniques and Mirror-Prox algorithms for solving structured large-scale semidefinite optimization problems up to a moderate accuracy. These methods require a very specific problem format. However, generic semidefinite optimization problems do not comply with these requirements. In a preliminary step, we recast slightly structured semidefinite optimization problems in an alternative form to which these methods are applicable, namely as matrix saddle-point problems. The final methods have a complexity result that depends linearly in both the number of constraints and the inverse of the target accuracy. Smoothing Techniques constitute a two-stage procedure: we derive a smooth approximation of the objective function at first and apply an optimal First-Order method to the adapted problem afterwards. We present a refined version of this optimal First-Order method in this thesis. The worst-case complexity result for this modified scheme is of the same order as for the original method. However, numerical results show that this alternative scheme needs much less iterations than it



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