1. Record Nr. UNINA9910780730603321

| | |
|---|---|
| Autore | Lasserre Jean-Bernard <1953-> |
| Titolo | Moments, positive polynomials and their applications [[electronic resource] /] / Jean-Bernard Lasserre |
| Pubbl/distr/stampa | London, : Imperial College Press, 2009 |
| ISBN | 1-282-76000-9<br>9786612760006<br>1-84816-446-7 |
| Descrizione fisica | 1 online resource (384 p.) |
| Collana | Imperial College Press optimization series, , 2041-1677 ; ; 1 |
| Disciplina | 330.0151 |
| Soggetti | Moments method (Statistics)<br>Polynomials |
| Lingua di pubblicazione | Inglese |
| Formato | Materiale a stampa |
| Livello bibliografico | Monografia |
| Note generali | Description based upon print version of record. |
| Nota di bibliografia | Includes bibliographical references and index. |
| Nota di contenuto | Contents; Preface; Acknowledgments; Part I Moments and Positive Polynomials; 1. The Generalized Moment Problem; 1.1 Formulations; 1.2 Duality Theory; 1.3 Computational Complexity; 1.4 Summary; 1.5 Exercises; 1.6 Notes and Sources; 2. Positive Polynomials; 2.1 Sum of Squares Representations and Semi-de nite Optimization; 2.2 Nonnegative Versus s.o.s. Polynomials; 2.3 Representation Theorems: Univariate Case; 2.4 Representation Theorems: Mutivariate Case; 2.5 Polynomials Positive on a Compact Basic Semi-algebraic Set; 2.5.1 Representations via sums of squares<br>2.5.2 A matrix version of Putinar's Positivstellensatz2.5.3 An alternative representation; 2.6 Polynomials Nonnegative on Real Varieties; 2.7 Representations with Sparsity Properties; 2.8 Representation of Convex Polynomials; 2.9 Summary; 2.10 Exercises; 2.11 Notes and Sources; 3. Moments; 3.1 The One-dimensional Moment Problem; 3.1.1 The full moment problem; 3.1.2 The truncated moment problem; 3.2 The Multi-dimensional Moment Problem; 3.2.1 Moment and localizing matrix; 3.2.2 Positive and at extensions of moment matrices; 3.3 The K-moment Problem; 3.4 Moment Conditions for Bounded Density<br>3.4.1 The compact case3.4.2 The non compact case; 3.5 Summary; 3.6 Exercises; 3.7 Notes and Sources; 4. Algorithms for Moment Problems; 4.1 The Overall Approach; 4.2 Semide nite Relaxations; 4.3 Extraction |

Sommario/riassunto

Many important applications in global optimization, algebra, probability and statistics, applied mathematics, control theory, financial mathematics, inverse problems, etc. can be modeled as a particular instance of the <i>Generalized Moment Problem (GMP)</i>.  This book introduces a new general methodology to solve the GMP when its data are polynomials and basic semi-algebraic sets. This methodology combines semidefinite programming with recent results from real algebraic geometry to provide a hierarchy of semidefinite relaxations converging to the desired optimal value. Applied on appropriat