



Algorithms in real algebraic geometry /

Basu, Saugata (1968-)

Springer, 2006

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Monografía

The algorithmic problems of real algebraic geometry such as real root counting, deciding the existence of solutions of systems of polynomial equations and inequalities, finding global maxima or deciding whether two points belong in the same connected component of a semi-algebraic set appear frequently in many areas of science and engineering. In this first-ever graduate textbook on the algorithmic aspects of real algebraic geometry, the main ideas and techniques presented form a coherent and rich body of knowledge, linked to many areas of mathematics and computing. Mathematicians already aware of real algebraic geometry will find relevant information about the algorithmic aspects, and researchers in computer science and engineering will find the required mathematical background. Being self-contained the book is accessible to graduate students and even, for invaluable parts of it, to undergraduate students. This revised second edition contains several recent results, notably on discriminants of symmetric matrices, real root isolation, global optimization, quantitative results on semi-algebraic sets and the first single exponential algorithm computing their first Betti number. An index of notation has also been added

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Título: Algorithms in real algebraic geometry Saugata Basu, Richard Pollack, Marie-Françoise Roy

Edición: 2nd ed

Editorial: Berlin New York Springer 2006

Descripción física: 1 online resource (ix, 662 pages) illustrations

Mención de serie: Algorithms and computation in mathematics 1431-1550 v. 10

Bibliografía: Includes bibliographical references (pages 587-593)-and indexes

Contenido: Introduction -- 1 Algebraically Closed Fields -- 2 Real Closed Fields -- 3 Semi-Algebraic Sets -- 4 Algebra -- 5 Decomposition of Semi-Algebraic Sets -- 6 Elements of Topology -- 7 Quantitative Semi-Algebraic Geometry -- 8 Complexity of Basic Algorithms -- 9 Cauchy Index and Applications -- 10 Real Roots -- 11 Cylindrical Decomposition Algorithm -- 12 Polynomial System Solving -- 13 Existential Theory of the Reals -- 14 Quantifier Elimination -- 15 Computing Roadmaps and Connected Components of Algebraic Sets -- 16 Computing Roadmaps and Connected Components of Semi-Algebraic Sets -- References -- Index of Notation -- Index

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756424376 880103584 922961124 957339054 1035661050 1044594123 1056381800 1086930801 1097262947
1102297344 1110949284 1111042813 1112542066

ISBN: 9783540330998 3540330992 9783540330981 3540330984 9783540009733 3540009736 3540009736

Materia: Geometry, Algebraic- Data processing Algorithms Algorithms. Algebraische meetkunde. Geometria
algebraica real. Algoritmos Geometry, Algebraic- Data processing. Algorithms. Geometry, Algebraic- Data
processing. Algebraische meetkunde. Geometria algebraica real. Algoritmos

Autores: Pollack, Richard Roy, M.-F. (Marie-Françoise)

Enlace a formato físico adicional: Print version Basu, Saugata, 1968-. Algorithms in real algebraic geometry. 2nd
ed. Berlin ; New York : Springer, 2006 3540330984 9783540330981 (DLC) 2006927110 (OCoLC)70573945

Punto acceso adicional serie-Título: Algorithms and computation in mathematics v. 10. 1431-1550

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