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Geometric Problems on Maxima and Minima

Springer Science & Business Media **Presents hundreds of extreme value problems, examples, and solutions primarily through Euclidean geometry Unified approach to the subject, with emphasis on geometric, algebraic, analytic, and combinatorial reasoning Applications to physics, engineering, and economics Ideal for use at the junior and senior undergraduate level, with wide appeal to students, teachers, professional mathematicians, and puzzle enthusiasts**

Challenging Problems in Geometry

Courier Corporation **Collection of nearly 200 unusual problems dealing with congruence and parallelism, the Pythagorean theorem, circles, area relationships, Ptolemy and the cyclic quadrilateral, collinearity and concurrency and more. Arranged in order of difficulty. Detailed solutions.**

Geometric Methods and Optimization Problems

Springer Science & Business Media **VII Preface In many fields of mathematics, geometry has established itself as a fruitful method and common language for describing basic phenomena and problems as well as suggesting ways of solutions. Especially in pure mathematics this is ob vious and well-known (examples are the much discussed interplay between lin ear algebra and analytical geometry and several problems in multidimensional analysis). On the other hand, many specialists from applied mathematics seem to prefer more formal analytical and numerical methods and representations. Nevertheless, very often the internal development of disciplines from applied mathematics led to geometric models, and occasionally breakthroughs were b~ed on geometric insights. An excellent example is the Klee-Minty cube, solving a problem of linear programming by transforming it into a geomet ric problem. Also the development of convex programming in recent decades demonstrated the power of methods that evolved within the field of convex geometry. The present book focuses on three applied disciplines: control theory, location science and computational geometry. It is our aim to demonstrate how methods and topics from convex geometry in a wider sense (separation theory of convex cones, Minkowski geometry, convex partitionings, etc.) can help to solve various problems from these disciplines.**

Old and New Unsolved Problems in Plane Geometry and Number Theory

American Mathematical Soc. **Victor Klee and Stan Wagon discuss some of the unsolved problems in number theory and geometry, many of which can be understood by readers with a very modest mathematical background. The presentation is organized around 24 central problems, many of which are accompanied by other, related problems. The authors place each problem in its historical and mathematical context, and the discussion is at the level of undergraduate mathematics. Each problem section is presented in two parts. The first gives an elementary overview discussing the history and both the solved and unsolved variants of the problem. The second part contains more details, including a few proofs of related results, a wider and deeper survey of what is known about the problem and its relatives, and a large collection of references. Both parts contain exercises, with solutions. The book is aimed at both teachers and students of mathematics**

who want to know more about famous unsolved problems.

The Ancient Tradition of Geometric Problems

Courier Corporation **Illustrated study focuses on attempts by ancient Greeks to solve three classical problems: cube duplication, angle trisection, and circle quadrature. Origins of the study of conics, introduction of special mechanical curves, more. 1986 edition.**

A Bridge To Linear Algebra

World Scientific **The book makes a first course in linear algebra more accessible to the majority of students and it assumes no prior knowledge of the subject. It provides a careful presentation of particular cases of all core topics. Students will find that the explanations are clear and detailed in manner. It is considered as a bridge over the obstacles in linear algebra and can be used with or without the help of an instructor.While many linear algebra texts neglect geometry, this book includes numerous geometrical applications. For example, the book presents classical analytic geometry using concepts and methods from linear algebra, discusses rotations from a geometric viewpoint, gives a rigorous interpretation of the right-hand rule for the cross product using rotations and applies linear algebra to solve some nontrivial plane geometry problems.Many students studying mathematics, physics, engineering and economics find learning introductory linear algebra difficult as it has high elements of abstraction that are not easy to grasp. This book will come in handy to facilitate the understanding of linear algebra whereby it gives a comprehensive, concrete treatment of linear algebra in R^2 and R^3. This method has been shown to improve, sometimes dramatically, a student's view of the subject.**

Parallel Problem Solving from Nature - PPSN VII

7th International Conference, Granada, Spain, September 7-11, 2002, Proceedings

Springer **We are proud to introduce the proceedings of the Seventh International C- ference on Parallel Problem Solving from Nature, PPSN VII,**

held in Granada, Spain, on 7–11 September 2002. PPSN VII was organized back-to-back with the Foundations of Genetic Algorithms (FOGA) conference, which took place in Torremolinos, Malaga, Spain, in the preceding week. ThePPSNseriesofconferencesstartedinDortmund,Germany[1].Fromthat pioneering meeting, the event has been held biennially, in Brussels, Belgium [2], Jerusalem, Israel [3], Berlin, Germany [4], Amsterdam, The Netherlands [5], and Paris, France [6]. During the Paris conference, several bids to host PPSN 2002 were put forward; it was decided that the conference would be held in Granada with Juan J. Merelo Guerv´ os as General Chairman. The scienti?c content of the PPSN conference focuses on problem-solving paradigms gleaned from natural models, with an obvious emphasis on those that display an innate parallelism, such as evolutionary algorithms and ant-colony optimization algorithms. The majority of the papers, however, concentrate on evolutionary and hybrid algorithms, as is shown in the contents of this book and itspredecessors.Thiseditionoftheconferenceproceedingshasalargesectionon applications,betheytoclassicalproblemsortoreal-worldengineeringproblems, which shows how bioinspired algorithms are extending their use in the realms of business and enterprise.

The Art of Mathematical Problem Solving

Lulu.com Mathematics is a fine art, like painting, sculpture, or music. This book teaches the art of solving challenging mathematics problems. Part I presents a general process for solving problems. Part II contains 35 difficult and challenging mathematics problems with complete solutions. The goal is to teach the reader how to proceed from an initial state of "panic and fear" to finding a beautiful and elegant solution to a problem.

Geometric Algebra for Computer Graphics

Springer Science & Business Media Geometric algebra (a Clifford Algebra) has been applied to different branches of physics for a long time but is now being adopted by the computer graphics community and is providing exciting new ways of solving 3D geometric problems. The author tackles this complex subject with inimitable style, and provides an accessible and very readable introduction. The book is filled with lots of clear examples and is very well illustrated. Introductory chapters look at algebraic axioms, vector algebra and geometric conventions and the book closes with a chapter on how the algebra is applied to computer graphics.

Geometric Problems in the Theory of Infinite-dimensional Probability Distributions

American Mathematical Soc. **Discusses problems in the distribution theory of probability.**

Guide to Geometric Algebra in Practice

Springer Science & Business Media **This highly practical Guide to Geometric Algebra in Practice reviews algebraic techniques for geometrical problems in computer science and engineering, and the relationships between them. The topics covered range from powerful new theoretical developments, to successful applications, and the development of new software and hardware tools. Topics and features: provides hands-on review exercises throughout the book, together with helpful chapter summaries; presents a concise introductory tutorial to conformal geometric algebra (CGA) in the appendices; examines the application of CGA for the description of rigid body motion, interpolation and tracking, and image processing; reviews the employment of GA in theorem proving and combinatorics; discusses the geometric algebra of lines, lower-dimensional algebras, and other alternatives to 5-dimensional CGA; proposes applications of coordinate-free methods of GA for differential geometry.**

DNA Computing and Molecular Programming

18th International Conference, DNA 18, Aarhus, Denmark, August 14-17, 2012, Proceedings

Springer **This book constitutes the refereed proceedings of the 18th International Conference on DNA Computing and Molecular Programming, DNA 18, held in Aarhus, Denmark, in August 2012. The 11 full papers presented were carefully selected from 37 submissions. The papers are**

organized in topical sections on advancing the engineering and science of biology and chemistry from the point of view of computer science, physics, and mathematics.

A Program for the Solution of a Class of Geometric-analogy Intelligence-test Questions

The novel organization of the program in terms of figure descriptions, which are analyzed to find transformation rules, and rule descriptions, which are analyzed to find 'common generalizations' of pairs of transformation rules, has implications for the design of problem-solving programs and for machine learning. These implications are discussed at some length and suggestions are made for work on pattern-recognition and learning techniques based on ideas developed in the course of the present investigation.

Geometric Theory of Singular Phenomena in Partial Differential Equations

Cambridge University Press **Proceedings from a conference on geometry and partial differential equations.**

Geometric Measure Theory and Minimal Surfaces

Lectures given at a Summer School of the Centro Internazionale Matematico Estivo (C.I.M.E.) held in Varenna (Como), Italy, August 24 -

September 2, 1972

Springer Science & Business Media **W.K. ALLARD: On the first variation of area and generalized mean curvature.- F.J. ALMGREN Jr.: Geometric measure theory and elliptic variational problems.- E. GIUSTI: Minimal surfaces with obstacles.- J. GUCKENHEIMER: Singularities in soap-bubble-like and soap-film-like surfaces.- D. KINDERLEHRER: The analyticity of the coincidence set in variational inequalities.- M. MIRANDA: Boundaries of Caciopoli sets in the calculus of variations.- L. PICCININI: De Giorgi's measure and thin obstacles.**

Geometric Analysis

American Mathematical Soc. **This volume includes expanded versions of the lectures delivered in the Graduate Minicourse portion of the 2013 Park City Mathematics Institute session on Geometric Analysis. The papers give excellent high-level introductions, suitable for graduate students wishing to enter the field and experienced researchers alike, to a range of the most important areas of geometric analysis. These include: the general issue of geometric evolution, with more detailed lectures on Ricci flow and Kähler-Ricci flow, new progress on the analytic aspects of the Willmore equation as well as an introduction to the recent proof of the Willmore conjecture and new directions in min-max theory for geometric variational problems, the current state of the art regarding minimal surfaces in R3, the role of critical metrics in Riemannian geometry, and the modern perspective on the study of eigenfunctions and eigenvalues for Laplace–Beltrami operators.**

Mathematics for Computer Graphics

Springer Science & Business Media **John Vince explains a wide range of mathematical techniques and problem-solving strategies associated with computer games, computer animation, virtual reality, CAD, and other areas of computer graphics. Covering all the mathematical techniques required to resolve geometric problems and design computer programs for computer graphic applications, each chapter explores a specific mathematical topic prior to moving forward into the more advanced areas of matrix transforms, 3D curves and surface patches. Problem-solving techniques using vector analysis and geometric algebra are also discussed. All the key areas are covered including: Numbers, Algebra, Trigonometry, Coordinate geometry, Transforms, Vectors, Curves and surfaces, Barycentric coordinates, Analytic geometry. Plus – and unusually in a student textbook – a chapter on geometric algebra is included.**

Geometric Algebra Computing in Engineering and Computer Science

Springer Science & Business Media **This useful text offers new insights and solutions for the development of theorems, algorithms and advanced methods for real-time applications across a range of disciplines. Its accessible style is enhanced by examples, figures and experimental analysis.**

Improving your C# Skills

Solve modern challenges with functional programming and test-driven techniques of C#

Packt Publishing Ltd **Conquer complex and interesting programming challenges by building robust and concurrent applications with caches, cryptography, and parallel programming. Key FeaturesUnderstand how to use .NET frameworks like the Task Parallel Library (TPL)and CryptoAPIDevelop a containerized application based on microservices architectureGain insights into memory management techniques in .NET CoreBook Description This Learning Path shows you how to create high performing applications and solve programming challenges using a wide range of C# features. You'll begin by learning how to identify the bottlenecks in writing programs, highlight common performance pitfalls, and apply strategies to detect and resolve these issues early. You'll also study the importance of micro-services architecture for building fast applications and implementing resiliency and security in .NET Core. Then, you'll study the importance of defining and testing boundaries, abstracting away third-party code, and working with different types of test double, such as spies, mocks, and fakes. In addition to describing programming trade-offs, this Learning Path will also help you build a useful toolkit of techniques, including value caching, statistical analysis, and geometric algorithms. This Learning Path includes content from the following Packt products: C# 7 and .NET Core 2.0 High Performance by Ovais Mehboob Ahmed KhanPractical Test-Driven Development using C# 7 by John Callaway, Clayton HuntThe Modern C# Challenge by Rod StephensWhat you**

will learnMeasure application performance using BenchmarkDotNetLeverage the Task Parallel Library (TPL) and Parallel Language Integrated Query (PLINQ)library to perform asynchronous operationsModify a legacy application to make it testableUse LINQ and PLINQ to search directories for files matching patternsFind areas of polygons using geometric operationsRandomize arrays and lists with extension methodsUse cryptographic techniques to encrypt and decrypt strings and filesWho this book is for If you want to improve the speed of your code and optimize the performance of your applications, or are simply looking for a practical resource on test driven development, this is the ideal Learning Path for you. Some familiarity with C# and .NET will be beneficial.

The Geometric Supposer

What Is It A Case Of?

Routledge **This volume is a case study of education reform and innovation using technology that examines the issue from a wide variety of perspectives. It brings together the views and experiences of software designers, curriculum writers, teachers and students, researchers and administrators. Thus, it stands in contrast to other analyses of innovation that tend to look through the particular prisms of research, classroom practice, or software design. The Geometric Supposer encourages a belief in a better tomorrow for schools. On its surface, the Geometric Supposer provides the means for radically altering the way in which geometry is taught and the quality of learning that can be achieved. At a deeper level, however, it suggests a powerful metaphor for improving education that can be played out in many different instructional contexts.**

Geometry for Computer Graphics

Formulae, Examples and Proofs

Springer **A complete overview of the geometry associated with computer graphics that provides everything a reader needs to understand the topic. Includes a summary hundreds of formulae used to solve 2D and 3D geometric problems; worked examples; proofs; mathematical strategies for solving geometric problems; a glossary of terms used in geometry.**

Math for Electricity & Electronics

Cengage Learning **With its fresh reader-friendly design, MATHEMATICS FOR ELECTRICITY AND ELECTRONICS, 4E is more current, comprehensive, and relevant than ever before. Packed with practical exercises and examples, it**

equips learners with a thorough understanding of essential algebra and trigonometry for electricity and electronics technology, while helping them improve critical thinking skills. Well-illustrated information sharpens the reader's ability to think quantitatively, predict results, and troubleshoot effectively, while drill and practice sets reinforce comprehension. To ensure mastery of the latest ideas and technology, the text thoroughly explains all mathematical concepts, symbols, and formulas required by future technicians and technologists. In addition, a new homework solution offers a wealth of online resources to maximize study efforts as well as provides an online testing tool for instructors. Important Notice: Media content referenced within the product description or the product text may not be available in the ebook version.

Future Vision and Trends on Shapes, Geometry and Algebra

Springer **Mathematical algorithms are a fundamental component of Computer Aided Design and Manufacturing (CAD/CAM) systems. This book provides a bridge between algebraic geometry and geometric modelling algorithms, formulated within a computer science framework. Apart from the algebraic geometry topics covered, the entire book is based on the unifying concept of using algebraic techniques – properly specialized to solve geometric problems – to seriously improve accuracy, robustness and efficiency of CAD-systems. It provides new approaches as well as industrial applications to deform surfaces when animating virtual characters, to automatically compare images of handwritten signatures and to improve control of NC machines. This book further introduces a noteworthy representation based on 2D contours, which is essential to model the metal sheet in industrial processes. It additionally reviews applications of numerical algebraic geometry to differential equations systems with multiple solutions and bifurcations. Future Vision and Trends on Shapes, Geometry and Algebra is aimed specialists in the area of mathematics and computer science on the one hand and on the other hand at those who want to become familiar with the practical application of algebraic geometry and geometric modelling such as students, researchers and doctorates.**

Geometric Algebra: An Algebraic System for Computer Games and

Animation

Springer Science & Business Media **Geometric algebra is still treated as an obscure branch of algebra and most books have been written by competent mathematicians in a very abstract style. This restricts the readership of such books especially by programmers working in computer graphics, who simply want guidance on algorithm design. Geometric algebra provides a unified algebraic system for solving a wide variety of geometric problems. John Vince reveals the beauty of this algebraic framework and communicates to the reader new and unusual mathematical concepts using colour illustrations, tabulations, and easy-to-follow algebraic proofs. The book includes many worked examples to show how the algebra works in practice and is essential reading for anyone involved in designing 3D geometric algorithms.**

Computer Graphics and Geometric Modelling Mathematics

Springer Science & Business Media **The second book of a two-volume work in which the author presents an overview of computer graphics as seen in the context of geometric modeling and the mathematics required to understand the subject.**

A User's Guide to Spectral Sequences

Cambridge University Press **Spectral sequences are among the most elegant and powerful methods of computation in mathematics. This book describes some of the most important examples of spectral sequences and some of their most spectacular applications. The first part treats the algebraic foundations for this sort of homological algebra, starting from informal calculations. The heart of the text is an exposition of the classical examples from homotopy theory, with chapters on the Leray-Serre spectral sequence, the Eilenberg-Moore spectral sequence, the Adams spectral sequence, and, in this new edition, the Bockstein spectral sequence. The last part of the book treats applications throughout mathematics, including the theory of knots and links, algebraic geometry, differential geometry and algebra. This is an excellent reference for students and researchers in geometry, topology, and algebra.**

Geometric Optimal Control
Theory, Methods and Examples

Springer Science & Business Media **This book gives a comprehensive treatment of the fundamental necessary and sufficient conditions for optimality for finite-dimensional, deterministic, optimal control problems. The emphasis is on the geometric aspects of the theory and on illustrating how these methods can be used to solve optimal control problems. It provides tools and techniques that go well beyond standard procedures and can be used to obtain a full understanding of the global structure of solutions for the underlying problem. The text includes a large number and variety of fully worked out examples that range from the classical problem of minimum surfaces of revolution to cancer treatment for novel therapy approaches. All these examples, in one way or the other, illustrate the power of geometric techniques and methods. The versatile text contains material on different levels ranging from the introductory and elementary to the advanced. Parts of the text can be viewed as a comprehensive textbook for both advanced undergraduate and all level graduate courses on optimal control in both mathematics and engineering departments. The text moves smoothly from the more introductory topics to those parts that are in a monograph style were advanced topics are presented. While the presentation is mathematically rigorous, it is carried out in a tutorial style that makes the text accessible to a wide audience of researchers and students from various fields, including the mathematical sciences and engineering. Heinz Schättler is an Associate Professor at Washington University in St. Louis in the Department of Electrical and Systems Engineering, Urszula Ledzewicz is a Distinguished Research Professor at Southern Illinois University Edwardsville in the Department of Mathematics and Statistics.**

Geometric Methods in Inverse Problems and PDE Control

Springer Science & Business Media **This IMA Volume in Mathematics and its Applications GEOMETRIC METHODS IN INVERSE PROBLEMS AND PDE CONTROL contains a selection of articles presented at 2001 IMA Summer Program with the same title. We would like to thank Christopher B. Croke (University of Penn sylva nia), Irena Lasiecka (University of Virginia), Gunther Uhlmann (University of Washington), and Michael S. Vogelius (Rutgers University) for their ex cellent work as organizers of the two-week summer workshop and for editing the volume. We also take this opportunity to thank the National Science Founda tion for their support of**

the IMA. Series Editors Douglas N. Arnold, Director of the IMA Fadil Santosa, Deputy Director of the IMA v PREFACE This volume contains a selected number of articles based on lectures delivered at the IMA 2001 Summer Program on "Geometric Methods in Inverse Problems and PDE Control. " The focus of this program was some common techniques used in the study of inverse coefficient problems and control problems for partial differential equations, with particular emphasis on their strong relation to fundamental problems of geometry. Inverse coefficient problems for partial differential equations arise in many application areas, for instance in medical imaging, nondestructive testing, and geophys ical prospecting. Control problems involving partial differential equations may arise from the need to optimize a given performance criterion, e. g. , to dampen out undesirable vibrations of a structure , or more generally, to obtain a prescribed behaviour of the dynamics.

Journal of the United States Artillery

Algorithms and Complexity

Elsevier **The second part of this Handbook presents a choice of material on the theory of automata and rewriting systems, the foundations of modern programming languages, logics for program specification and verification, and some chapters on the theoretic modelling of advanced information processing.**

Math Word Problems For Dummies

John Wiley & Sons **Covers percentages, probability, proportions, and more Get a grip on all types of word problems by applying them to real life Are you mystified by math word problems? This easy-to-understand guide shows you how to conquer these tricky questions with a step-by-step plan for finding the right solution each and every time, no matter the kind or level of problem. From learning math lingo and performing operations to calculating formulas and writing equations, you'll get all the skills you need to succeed! Discover how to: * Translate word problems into plain English * Brush up on basic math skills * Plug in the right operation or formula * Tackle algebraic and geometric problems * Check your answers to see if they work**

Handbook of Geometric Analysis

International Pressof Boston Incorporated **Geometric Analysis combines differential equations with differential geometry. An important aspect of geometric analysis is to approach geometric problems by studying differential equations. Besides some known linear differential operators such as the Laplace operator, many differential equations arising from**

differential geometry are nonlinear. A particularly important example is the Monge-Amperè equation. Applications to geometric problems have also motivated new methods and techniques in differential equations. The field of geometric analysis is broad and has had many striking applications.This handbook of geometric analysis—the first of the two to be published in the ALM series—presents introductions and survey papers treating important topics in geometric analysis, with their applications to related fields. It can be used as a reference by graduate students and by researchers in related areas.

Applied Computational Geometry. Towards Geometric Engineering

FCRC '96 Workshop, WACG '96, Philadelphia, PA, May 27 - 28, 1996, Selected Papers

Springer Science & Business Media **Content Description #Anthology selected from contributions to the First ACM Workshop on Applied Computational Geometry.#Includes bibliographical references and index.**

Geometric Computations with Interval and New Robust Methods

Applications in Computer Graphics, GIS and Computational Geometry

Elsevier **This undergraduate and postgraduate text will familiarise readers with interval arithmetic and related tools to gain reliable and validated results and logically correct decisions for a variety of geometric computations plus the means for alleviating the effects of the errors. It also considers computations on geometric point-sets, which are neither robust nor reliable in processing with standard methods. The authors provide two effective tools for obtaining correct results: (a) interval arithmetic, and (b) ESSA the new powerful algorithm which improves many geometric computations and makes them rounding error free. Familiarises the reader with interval arithmetic and related tools to gain reliable and validated results and logically correct decisions for a variety of geometric**

computations Provides two effective methods for obtaining correct results in interval arithmetic and ESSA

Vision Geometry

New Analytic and Geometric Methods in Inverse Problems

Lectures given at the EMS Summer School and Conference held in Edinburgh, Scotland 2000

Springer Science & Business Media **In inverse problems, the aim is to obtain, via a mathematical model, information on quantities that are not directly observable but rather depend on other observable quantities. Inverse problems are encountered in such diverse areas of application as medical imaging, remote sensing, material testing, geosciences and financing. It has become evident that new ideas coming from differential geometry and modern analysis are needed to tackle even some of the most classical inverse problems. This book contains a collection of presentations, written by leading specialists, aiming to give the reader up-to-date tools for understanding the current developments in the field.**

Geometry of Isotropic Convex Bodies

American Mathematical Soc. **The study of high-dimensional convex bodies from a geometric and analytic point of view, with an emphasis on the dependence of various parameters on the dimension stands at the intersection of classical convex geometry and the local theory of Banach spaces. It is also closely linked to many other fields, such as probability theory, partial differential equations, Riemannian geometry, harmonic analysis and combinatorics. It is now understood that the convexity assumption forces most of the volume of a high-dimensional convex body to be concentrated in some canonical way and the main question is whether, under some natural normalization, the answer to many fundamental questions should be independent of the dimension. The aim of this book is to introduce a number of well-known questions regarding the distribution of volume in high-dimensional convex bodies, which are**

exactly of this nature: among them are the slicing problem, the thin shell conjecture and the Kannan-Lovász-Simonovits conjecture. This book provides a self-contained and up to date account of the progress that has been made in the last fifteen years.

O-level Mathematics Challenging Learn-By-Example (Concise) (Yellowreef)

Yellowreef Limited • **covers latest MOE syllabus • comprehensive examples and solutions for quick revision • helps students to familiarise with various exam question-types • complete edition and concise edition eBooks available**

Algorithmic and Geometric Aspects of Robotics (Routledge Revivals)

Routledge **First published in 1987, the seven chapters that comprise this book review contemporary work on the geometric side of robotics. The first chapter defines the fundamental goal of robotics in very broad terms and outlines a research agenda each of whose items constitutes a substantial area for further research. The second chapter presents recently developed techniques that have begun to address the geometric side of this research agenda and the third reviews several applied geometric ideas central to contemporary work on the problem of motion planning. The use of Voronoi diagrams, a theme opened in these chapters, is explored further later in the book. The fourth chapter develops a theme in computational geometry having obvious significance for the simplification of practical robotics problems — the approximation or decomposition of complex geometric objects into simple ones. The final chapters treat two examples of a class of geometric 'reconstruction' problem that have immediate application to computer-aided geometric design systems.**

Applications of Computational Algebraic Geometry

American Mathematical Society Short Course, January 6-7, 1997, San Diego, California

American Mathematical Soc. **This book introduces readers to key ideas and applications of computational algebraic geometry. Beginning with the discovery of Grobner bases and fueled by the advent of modern computers and the rediscovery of resultants, computational algebraic geometry has grown rapidly in importance. The fact that 'crunching equations' is now as easy as 'crunching numbers' has had a profound impact in recent years. At the same time, the mathematics used in computational algebraic geometry is unusually elegant and accessible, which makes the subject easy to learn and easy to apply. This book begins with an introduction to Grobner bases and resultants, then discusses some of the more recent methods for solving systems of polynomial equations. A sampler of possible applications follows, including computer-aided geometric design, complex information systems, integer programming, and algebraic coding theory. The lectures in the book assume no previous acquaintance with the material.**