Multidimensional Analysis Algebras And Systems Fo

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Elimination Methods in Polynomial Computer Algebra - V. Bykov 2012-12-06
The subject of this book is connected with a new direction in mathematics, which has been actively developed over the last few years, namely the field of polynomial computer algebra, which lies at the intersection point of algebra, mathematical analysis and programming. There were several incentives to write the book. First of all, there has lately been a considerable interest in applied nonlinear problems characterized by multiple sta tionary states. Practical needs have then in their turn led to the appearance of new theoretical results in the analysis of systems of nonlinear algebraic equations. And finally, the introduction of various computer packages for analytic manipulations has made it possible to use complicated elimination-theoretical algorithms in prac tical research. The structure of the book is accordingly represented by three main parts: Mathematical results driven to constructive algorithms, computer algebra realizations of these algorithms, and applications. Nonlinear systems of algebraic equations arise in diverse fields of science. In particular, for processes described by systems of differential equations with a poly nomial right hand side one is faced with the problem of determining the number (and location) of the stationary states in certain sets.

Gröbner Bases in Symbolic Analysis - Markus Rosenkranz 2007-01-01
This volume contains survey articles and original research papers, presenting the state of the art on applying the symbolic approach of Gröbner bases and related methods to differential and difference equations. The contributions are based on talks delivered at the Special Semester on Gröbner Bases and Related Methods hosted by the Johann Radon Institute of Computational and Applied Mathematics, Linz, Austria, in May 2006.

Computer-Aided Analysis of Difference Schemes for Partial Differential Equations - Victor G. Ganzha 2011-03-01
Advances in computer technology have conveniently coincided withtrends in numerical analysis toward increased complexity ofcomputational algorithms based on finite difference methods. It isno longer feasible to perform stability investigation of thesemethods manually--and no longer necessary. As this book shows,modern computer algebra tools can be combined with methods fromnumerical analysis to generate programs that will do the jobautomatically. Comprehensive, timely, and accessible--this is the definitivereference on the application of computerized symbolic manipulationsfor analyzing the stability of a wide range of difference schemes.In particular, it deals with those schemes that are used to solvecomplex physical problems in areas such as gas dynamics, heat andmass transfer, catastrophe theory, elasticity, shallow watertheory, and more. Introducing many new applications, methods, and concepts,Computer-Aided Analysis of Difference Schemes for PartialDifferential Equations * Shows how computational algebra expedites the task of stabilityanalysis--whatever the approach to stability investigation * Covers ten different approaches for each stability method * Deals with the specific characteristics of each method and itsapplication to problems commonly encountered by numerical modelers * Describes all basic mathematical formulas that are necessary toimplement each algorithm * Provides each formula in several global algebraic symboliclanguages, such as MAPLE, MATHEMATICA, and REDUCE * Includes numerous illustrations and thought-provoking examplesthroughout the text For mathematicians, physicists, and engineers, as well as forpostgraduate students, and for anyone involved with numericsolutions for real-world physical problems, this book provides avaluable resource, a helpful guide, and a head start

ondevelopments for the twenty-first century.
Applications of Time Delay Systems - John Chiasson 2007-04-16
This book provides an update of the latest research in control of time delay systems and applications by world leading experts. It will appeal to engineers, researchers and students in Control.
Multidimensional Analysis - George W. Hart 1995-03-17
This book deals with the mathematical properties of dimensioned quantities, such as length, mass, voltage, and viscosity. Beginning with a careful examination of how one expresses the numerical results of a measurement and uses these results in subsequent manipulations, the author rigorously constructs the notion of dimensioned numbers and discusses their algebraic structure. The result is a unification of linear algebra and traditional dimensional analysis that can be extended from the scalars to which the traditional analysis is perforce restricted to multidimensional vectors of the sort frequently encountered in engineering, systems theory, economics, and other applications.

E-Learning as a Socio-Cultural System: A Multidimensional Analysis - Zuzevi?i?t?, Vaiva 2014-06-30
Information and communication technologies play a crucial role in a number of modern industries. Among these, education has perhaps seen the greatest increases in efficiency and availability through Internet-based technologies. E-Learning as a Socio-Cultural System: A Multidimensional Analysis provides readers with a critical examination of the theories, models, and best practices in online education from a social perspective, evaluating blended, distance, and mobile learning systems with a focus on the interactions of their practitioners. Within the pages of this volume, teachers, students, administrators, policy makers, and IT professionals will all find valuable advice and enriching personal experiences in the field of online education.

Algebraic and Symbolic Computation Methods in Dynamical Systems - Alban Quadrat 2020-05-30
This book aims at reviewing recent progress in the direction of algebraic and symbolic computation methods for functional systems, e.g. ODE systems, differential time-delay equations, difference equations and integro-differential equations. In the nineties, modern algebraic theories were introduced in mathematical systems theory and in control theory. Combined with real algebraic geometry, which was previously introduced in control theory, the past years have seen a flourishing development of algebraic methods in control theory. One of the strengths of algebraic methods lies in their close connections to computations. The use of the above-mentioned algebraic theories in control theory has been an important source of motivation to develop effective versions of these theories (when possible). With the development of computer algebra and computer algebra systems, symbolic methods for control theory have been developed over the past years. The goal of this book is to propose a partial state of the art in this direction. To make recent results more easily accessible to a large audience, the chapters include materials which survey the main mathematical methods and results and which are illustrated with explicit examples.

Nonlinear Control Systems Design 1989 - A. Isidori 2014-05-23
In the last two decades, the development of specific methodologies for the control of systems described by nonlinear mathematical models has attracted an ever increasing interest. New breakthroughs have occurred which have aided the design of nonlinear control systems. However there are still limitations which must be understood, some of which were addressed at the IFAC Symposium in Capri. The emphasis was on the methodological developments, although a number of the papers were concerned with the

presentation of applications of nonlinear design philosophies to actual control problems in chemical, electrical and mechanical engineering.

System Theory, the Schur Algorithm and Multidimensional Analysis - Daniel Alpay 2007-03-20
This volume contains six peer-refereed articles written on the occasion of the workshop Operator theory, system theory and scattering theory: multidimensional generalizations and related topics, held at the Department of Mathematics of the Ben-Gurion University of the Negev in June, 2005. The book will interest a wide audience of pure and applied mathematicians, electrical engineers and theoretical physicists.

Symbolic Methods in Control System Analysis and Design - N. Munro 1999
Fifteen contributions provide an up-to-date treatment of issues in system modeling, system analysis, design and synthesis methods, and nonlinear systems. Coverage includes the application of multidimensional Laplace transforms to the modeling of nonlinear elements, a survey of customized computer algebra modeling programs for multibody dynamical systems, robust control of linear systems using a new linear programming approach, the development and testing of a new branch-and-bound algorithm fir global optimization using symbolic algebra techniques, and dynamic sliding mode control design using symbolic algebra tools.

Advances in Databases and Information Systems - Yannis Ioannidis 2007-09-06
This book constitutes the refereed proceedings of the 11th East European Conference on Advances in Databases and Information Systems, ADBIS 2007, held in Varna, Bulgaria, in September/October 2007. The 23 revised papers presented together with three invited lectures were carefully reviewed and selected from 77 submissions. The papers address current research on database theory, development of advanced DBMS technologies, and their advanced applications.

Advances in Databases and Information Systems - Barbara Catania 2010-09-09
This book constitutes the refereed proceedings of the 14th East European Conference on Advances in Databases and Information Systems, ADBIS 2010, held in Novi Sad, Serbia on September 20-24, 2010. The 36 revised full papers and 14 short papers were carefully selected from 165 submissions. Tolically the papers span a wide spectrum of topics in the database and information systems field, including database theory, advanced DBMS technologies, design methods, data mining and data warehousing, spatio-temporal and graph structured data and database applications.

Progress in Industrial Mathematics at ECMI 2018 - István Faragó 2019-11-22
This book explores mathematics in a wide variety of applications, ranging from problems in electronics, energy and the environment, to mechanics and mechatronics. The book gathers 81 contributions submitted to the 20th European Conference on Mathematics for Industry, ECMI 2018, which was held in Budapest, Hungary in June 2018. The application areas include: Applied Physics, Biology and Medicine, Cybersecurity, Data Science, Economics, Finance and Insurance, Energy, Production Systems, Social Challenges, and Vehicles and Transportation. In turn, the mathematical technologies discussed include: Combinatorial Optimization, Cooperative Games, Delay Differential Equations, Finite Elements, Hamilton-Jacobi Equations, Impulsive Control, Information Theory and Statistics, Inverse Problems, Machine Learning, Point Processes, Reaction-Diffusion Equations, Risk Processes, Scheduling Theory, Semidefinite Programming, Stochastic Approximation, Spatial Processes, System Identification, and Wavelets. The goal of the European Consortium for Mathematics in Industry (ECMI) conference series is to promote interaction between academia and industry, leading to innovations in both fields. These events have attracted leading experts from business, science and academia, and have promoted the application of novel mathematical technologies to industry. They have also encouraged industrial sectors to share challenging problems where mathematicians can provide fresh insights and perspectives. Lastly, the ECMI conferences are one of the main forums in which significant advances in industrial mathematics are presented, bringing together prominent figures from business, science and academia to promote the use of innovative mathematics in industry.

Proceedings of the Fifth SIAM Conference on Applied Linear Algebra - John Gregg Lewis 1994-01-01

Multidimensional Analysis - George W. Hart 2012-12-06
This book deals with the mathematical properties of dimensioned quantities, such as length, mass, voltage,

and viscosity. Beginning with a careful examination of how one expresses the numerical results of a measurement and uses these results in subsequent manipulations, the author rigorously constructs the notion of dimensioned numbers and discusses their algebraic structure. The result is a unification of linear algebra and traditional dimensional analysis that can be extended from the scalars to which the traditional analysis is perforce restricted to multidimensional vectors of the sort frequently encountered in engineering, systems theory, economics, and other applications.

The History of Cartography, Volume 6 - Mark Monmonier 2015-05-18
For more than thirty years, the History of Cartography Project has charted the course for scholarship on cartography, bringing together research from a variety of disciplines on the creation, dissemination, and use of maps. Volume 6, Cartography in the Twentieth Century, continues this tradition with a groundbreaking survey of the century just ended and a new full-color, encyclopedic format. The twentieth century is a pivotal period in map history. The transition from paper to digital formats led to previously unimaginable dynamic and interactive maps. Geographic information systems radically altered cartographic institutions and reduced the skill required to create maps. Satellite positioning and mobile communications revolutionized wayfinding. Mapping evolved as an important tool for coping with complexity, organizing knowledge, and influencing public opinion in all parts of the globe and at all levels of society. Volume 6 covers these changes comprehensively, while thoroughly demonstrating the far-reaching effects of maps on science, technology, and society—and vice versa. The lavishly produced volume includes more than five hundred articles accompanied by more than a thousand images. Hundreds of expert contributors provide both original research, often based on their own participation in the developments they describe, and interpretations of larger trends in cartography. Designed for use by both scholars and the general public, this definitive volume is a reference work of first resort for all who study and love maps.

Nuclear Science Abstracts - 1966

Transactions on Large-Scale Data- and Knowledge-Centered Systems VIII - Abdelkader Hameurlain 2013-04-18
The LNCS journal Transactions on Large-Scale Data- and Knowledge-Centered Systems focuses on data management, knowledge discovery, and knowledge processing, which are core and hot topics in computer science. Since the 1990s, the Internet has become the main driving force behind application development in all domains. An increase in the demand for resource sharing across different sites connected through networks has led to an evolution of data- and knowledge-management systems from centralized systems to decentralized systems enabling large-scale distributed applications providing high scalability. Current decentralized systems still focus on data and knowledge as their main resource. Feasibility of these systems relies basically on P2P (peer-to-peer) techniques and the support of agent systems with scaling and decentralized control. Synergy between grids, P2P systems, and agent technologies is the key to data- and knowledge-centered systems in large-scale environments. This, the eighth issue of Transactions on Large-Scale Data- and Knowledge-Centered Systems, contains eight revised selected regular papers focusing on the following topics: scalable data warehousing via MapReduce, extended OLAP multidimensional models, naive OLAP engines and their optimization, advanced data stream processing and mining, semi-supervised learning of data streams, incremental pattern mining over data streams, association rule mining over data streams, frequent pattern discovery over data streams.

System Theory, the Schur Algorithm and Multidimensional Analysis - Daniel Alpay 2007-06-28
This volume contains six peer-refereed articles written on the occasion of the workshop Operator theory, system theory and scattering theory: multidimensional generalizations and related topics, held at the Department of Mathematics of the Ben-Gurion University of the Negev in June, 2005. The book will interest a wide audience of pure and applied mathematicians, electrical engineers and theoretical physicists.

Previews of Heat and Mass Transfer - 1996

Similarity and Modeling in Science and Engineering - Josef Kuneš 2012-04-05
The present text sets itself in relief to other titles on the subject in that it addresses the means and methodologies versus a narrow specific-task oriented approach. Concepts and their developments which

evolved to meet the changing needs of applications are addressed. This approach provides the reader with a general tool-box to apply to their specific needs. Two important tools are presented: dimensional analysis and the similarity analysis methods. The fundamental point of view, enabling one to sort all models, is that of information flux between a model and an original expressed by the similarity and abstraction Each chapter includes original examples and applications. In this respect, the models can be divided into several groups. The following models are dealt with separately by chapter; mathematical and physical models, physical analogues, deterministic, stochastic, and cybernetic computer models. The mathematical models are divided into asymptotic and phenomenological models. The phenomenological models, which can also be called experimental, are usually the result of an experiment on an complex object or process. The variable dimensionless quantities contain information about the real state of boundary conditions, parameter (non-linearity) changes, and other factors. With satisfactory measurement accuracy and experimental strategy, such models are highly credible and can be used, for example in control systems.

Escherichia coli O157:H7 in Ground Beef - Institute of Medicine 2002-12-19

USDA's Food Safety and Inspection Service (FSIS) is formulating risk assessments to identify important foodborne hazards; evaluate potential strategies to prevent, reduce, or eliminate those hazards; assess the effects of different mitigation strategies; and identify research needs. These risk assessments, in brief, empirically characterize the determinants of the presence or level of microbial contamination in vulnerable foodstuffs at various points leading up to consumption. One of the initial efforts in the undertaking is a risk assessment of the public health impact of E. coli O157:H7 in ground beef. In addition to soliciting public input, FSIS asked the Institute of Medicine (IOM) to convene a committee of experts to review the draft and offer recommendations and suggestions for consideration as the agency finalizes the document. This report presents the results of that review.

Matrix Mathematics - Dennis S. Bernstein 2009-07-26

Each chapter in this book describes relevant background theory followed by specialized results. Hundreds of identities, inequalities, and matrix facts are stated clearly with cross references, citations to the literature, and illuminating remarks.

Global Analysis. Studies and Applications I - Y.G. Borisovich 2006-12-08

This volume (a sequel to LNM 1108, 1214, 1334 and 1453) continues the presentation to English speaking readers of the Voronezh University press series on Global Analysis and Its Applications. The papers are selected fromtwo Russian issues entitled "Algebraic questions of Analysis and Topology" and "Nonlinear Operators in Global Analysis". CONTENTS: YuE. Gliklikh: Stochastic analysis, groups of diffeomorphisms and Lagrangian description of viscous incompressible fluid.- A. Ya. Helemskii: From topological homology: algebras with different properties of homological triviality.- V.V. Lychagin, L.V. Zil'bergleit: Duality in stable Spencer cohomologies.- O.R. Musin: On some problems of computational geometry and topology.- V.E. Nazaikinskii, B. Yu. Sternin, V.E. Shatalov: Introduction to Maslov's operational method (non-commutative analysis and differential equations).- Yu. B. Rudyak: The problem of realization of homology classes from Poincare up to the present.- V.G. Zvyagin, N.M. Ratiner: Oriented degree of Fredholm maps of non-negativeindex and its applications to global bifurcation of solutions.- A.A. Bolibruch: Fuchsian systems with reducible monodromy and the Riemann-Hilbert problem.- I.V. Bronstein, A. Ya. Kopanskii: Finitely smooth normal forms of vector fields in the vicinity of a rest point.- B.D. Gel'man: Generalized degree of multi-valued mappings.- G.N. Khimshiashvili: On Fredholmian aspects of linear transmission problems.- A.S. Mishchenko: Stationary solutions of nonlinear stochastic equations.- B. Yu. Sternin, V.E. Shatalov: Continuation of solutions to elliptic equations and localisation of singularities.- V.G. Zvyagin, V.T. Dmitrienko: Properness of nonlinear elliptic differential operators in H.

Theory of Heat Transfer with Forced Convection Film Flows - De-Yi Shang 2010-12-01

Developing a new treatment of 'Free Convection Film Flows and Heat Transfer' began in Shang's first monograph and is continued in this monograph. The current book displays the recent developments of laminar forced convection and forced film condensation. It is aimed at revealing the true features of heat and mass transfer with forced convection film flows to model the deposition of thin layers. The novel mathematical similarity theory model is developed to simulate temperature- and concentration- dependent physical processes. The following topics are covered in this book: 1. Mathematical methods - advanced

similarity analysis method to replace the traditional Falkner-Skan type transformation - a novel system of similarity analysis and transformation models to overcome the difficult issues of forced convection and forced film flows - heat and mass transfer equations based on the advanced similarity analysis models and equations formulated with rigorous key numerical solutions 2. Modeling the influence of physical factors - effect of thermal dissipation on forced convection heat transfer - a system of models of temperature and concentration-dependent variable physical properties based on the advanced temperature-parameter model and rigorous analysis model on vapor-gas mixture physical properties for the rigorous and convenient description of the governing differential equations - an available approach to satisfy interfacial matching conditions for rigorous and reliable solutions - a system of numerical results on velocity, temperature and concentration fields, as well as, key solutions on heat and mass transfer - the effect of non-condensable gas on heat and mass transfer for forced film condensation. This way it is realized to conveniently and reliably predict heat and mass transfer for convection and film flows and to resolve a series of current difficult issues of heat and mass transfer with forced convection film flows. Professionals in this fields as well as graduate students will find this a valuable book for their work.

Advanced Information Systems Engineering - Eric Dubois 2006-07-29

This book constitutes the refereed proceedings of the 18th International Conference on Advanced Information Systems Engineering, CAiSE 2006, held in Luxembourg, in June 2006. The book presents 33 revised full papers together with 3 keynote talks. The papers are organized in topical sections on security, conceptual modeling, queries, document conceptualization, service composition, workflow, business modeling, configuration and separation, business process modeling, agent orientation, and requirements management.

Strategic Advancements in Utilizing Data Mining and Warehousing Technologies: New Concepts and Developments - Taniar, David 2009-12-31

"This book presents and disseminates new concepts and developments in the areas of data warehousing and data mining, in particular on the research trends shaped during the last few years"--Provided by publisher.

Scalar, Vector, and Matrix Mathematics - Dennis S. Bernstein 2018-02-27

The essential reference book on matrices—now fully updated and expanded, with new material on scalar and vector mathematics Since its initial publication, this book has become the essential reference for users of matrices in all branches of engineering, science, and applied mathematics. In this revised and expanded edition, Dennis Bernstein combines extensive material on scalar and vector mathematics with the latest results in matrix theory to make this the most comprehensive, current, and easy-to-use book on the subject. Each chapter describes relevant theoretical background followed by specialized results. Hundreds of identities, inequalities, and facts are stated clearly and rigorously, with cross-references, citations to the literature, and helpful comments. Beginning with preliminaries on sets, logic, relations, and functions, this unique compendium covers all the major topics in matrix theory, such as transformations and decompositions, polynomial matrices, generalized inverses, and norms. Additional topics include graphs, groups, convex functions, polynomials, and linear systems. The book also features a wealth of new material on scalar inequalities, geometry, combinatorics, series, integrals, and more. Now more comprehensive than ever, Scalar, Vector, and Matrix Mathematics includes a detailed list of symbols, a summary of notation and conventions, an extensive bibliography and author index with page references, and an exhaustive subject index. Fully updated and expanded with new material on scalar and vector mathematics Covers the latest results in matrix theory Provides a list of symbols and a summary of conventions for easy and precise use Includes an extensive bibliography with back-referencing plus an author index

Gröbner Bases in Control Theory and Signal Processing - Hyungju Park 2007-01-01

This volume contains survey and original articles presenting the state of the art on the application of Gröbner bases in control theory and signal processing. The contributions are based on talks delivered at the Special Semester on Gröbner Bases and Related Methods at the Johann Radon Institute of Computational and Applied Mathematics (RICAM), Linz, Austria, in May 2006.

Artificial Intelligence in Education - Ben Du Boulay 1997

The theme of this book is Knowledge and Media in Learning Systems, and papers that explore the emerging

roles of intelligent multimedia and distributed technologies as well as computer supported collaboration within that theme are included. The spread of topics is very wide encompassing both well- established areas such as student modelling as well as more novel topics such as distributed intelligent tutoring on the World Wide Web. Far from undermining the need to understand how learning and teaching interact, the newer media continue to emphasise the interdependence of these two processes. Collaboration and tools for collaboration are the major topics of interest. Understanding how human learners collaborate, how peer tutoring works and how the computer can play a useful role as either a more able of even a less able learning partner are all explored here.

Geographic Information Systems: Concepts, Methodologies, Tools, and Applications - Management Association, Information Resources 2012-09-30
Developments in technologies have evolved in a much wider use of technology throughout science, government, and business; resulting in the expansion of geographic information systems. GIS is the academic study and practice of presenting geographical data through a system designed to capture, store, analyze, and manage geographic information. Geographic Information Systems: Concepts, Methodologies, Tools, and Applications is a collection of knowledge on the latest advancements and research of geographic information systems. This book aims to be useful for academics and practitioners involved in geographical data.

RAMAS Risk Calc 4.0 Software - Scott Ferson 2002-07-24
Many analysts use point estimates and ignore their uncertainty. But we can never be sure about the exact values of numbers based on data. And no practical calculations are without error, even though they may have the appearance of precision. RAMASâ Risk Calc 4.0 Software: Risk Assessment with Uncertain Numbers uses traditional methods such as probability theory and interval analysis and the newest techniques such as probability bounds analysis and fuzzy arithmetic to quantify uncertainty in risk assessments. It creates a convenient environment for computing in which all uncertainties are carried forward automatically. Providing examples in four major application areas, Risk Calc brings sophisticated methods of uncertainty analysis into the reach of anyone who can do arithmetic on a calculator.

Bioinformatics - David Edwards 2009-09-03
Bioinformatics is a relatively new field of research. It evolved from the requirement to process, characterize, and apply the information being produced by DNA sequencing technology. The production of DNA sequence data continues to grow exponentially. At the same time, improved bioinformatics such as faster DNA sequence search methods have been combined with increasingly powerful computer systems to process this information. Methods are being developed for the ever more detailed quantification of gene expression, providing an insight into the function of the newly discovered genes, while molecular genetic tools provide a link between these genes and heritable traits. Genetic tests are now available to determine the likelihood of suffering specific ailments and can predict how plant cultivars may respond to the environment. The steps in the translation of the genetic blueprint to the observed phenotype is being increasingly understood through proteome, metabolome and phenome analysis, all underpinned by advances in bioinformatics. Bioinformatics is becoming increasingly central to the study of biology, and a day at a computer can often save a year or more in the laboratory. The volume is intended for graduate-level biology students as well as researchers who wish to gain a better understanding of applied bioinformatics and who wish to use bioinformatics technologies to assist in their research. The volume would also be of value to bioinformatics developers, particularly those from a computing background, who would like to understand the application of computational tools for biological research. Each chapter would include a comprehensive introduction giving an overview of the fundamentals, aimed at introducing graduate students and researchers from diverse backgrounds to the field and bring them up-to-date on the current state of knowledge. To accommodate the broad range of topics in applied bioinformatics, chapters have been grouped into themes: gene and genome analysis, molecular genetic analysis, gene expression analysis, protein and proteome analysis, metabolome analysis, phenome data analysis, literature mining and bioinformatics tool development. Each chapter and theme provides an introduction to the biology behind the data describes the requirements for data processing and details some of the methods applied to the data to enhance biological understanding.

Recent Advances in Operator Theory and Applications - Tsuyoshi Ando 2008-12-19
Contains the proceedings of the International Workshop on Operator Theory and Applications (IWOTA 2006) held at Seoul National University, Seoul, Korea, from July 31 to August 3, 2006. This volume contains sixteen research papers which reflect developments in operator theory and applications.

Advanced Surface Engineering Materials - Ashutosh Tiwari 2016-09-06
Advanced surfaces enriches the high-throughput engineering of physical and chemical phenomenon in relatin to electrical, magnetic, electronics, thermal and optical controls, as well as large surface areas, protective coatings against water loss and excessive gas exchange. A more sophisticated example could be a highly selective surface permeability allowing passive diffusion and selective transport of molecules in the water or gases. The smart surface technology provides an interlayer model which prevents the entry of substances without affecting the properties of neighboring layers. A number of methods have been developed for coatings, which are essential building blocks for the top-down and/or bottom-up design of numerous functional materials. Advanced Surface Engineering Materials offers a detailed up-to-date review chapters on the functional coatings and adhesives, engineering of nanosurfaces, high-tech surface, characterization and new applications. The 13 chapters in this book are divided into 3 parts (Functional coatings and adhesives; Engineering of nanosurfaces; High-tech surface, characterization and new applications) and are all written by worldwide subject matter specialists. The book is written for readers from diverse backgrounds across chemistry, physics, materials science and engineering, medical science, environmental, bio- and nano- technologies and biomedical engineering. It offers a comprehensive view of cutting-edge research on surface engineering materials and their technological importance.

The Analysis of Complex Nonlinear Mechanical Systems - Martin Lesser 1995-09-20
The book covers the fundamentals of the mechanics of multibody systems, i.e., systems of interconnected rigid bodies. A geometric view is emphasized in which the techniques and algorithms are motivated by the picture of the rigid body system as a point in the multidimensional space of all possible configurations. The reader is introduced to computer algebra methods in the form of a system, called Sophia, which is implemented in the Maple symbolic manipulation system. The first chapter provides a motivational introduction to the basic principles and an introduction to Maple. Kinematics based on the idea of tangent vectors to the configuration manifold sets the stage for dynamical analysis. The latter ranges from the Lagrange and Gibbs-Appell to Kane's equations. Coverage includes nonholonomic systems and redundant variable methods. The computer algebra methods included enable the treatment of nontrivial mechanical systems and the development of efficient numerical codes for simulation.

Library of Congress Subject Headings - Library of Congress 2012

The State Space Method - Daniel Alpay 2006
The state space method developed in the last decades allows us to study the theory of linear systems by using tools from the theory of linear operators; conversely, it had a strong influence on operator theory introducing new questions and topics. The present volume contains a collection of essays representing some of the recent advances in the state space method. Methods covered include noncommutative systems theory, new aspects of the theory of discrete systems, discrete analogs of canonical systems, and new applications to the theory of Bezoutiants and convolution equations. The articles in the volume will be of interest to pure and applied mathematicians, electrical engineers and theoretical physicists.

Kronecker Modeling and Analysis of Multidimensional Markovian Systems - Tuğrul Dayar 2018-09-21
This work considers Kronecker-based models with finite as well as countably infinite state spaces for multidimensional Markovian systems by paying particular attention to those whose reachable state spaces are smaller than their product state spaces. Numerical methods for steady-state and transient analysis of Kronecker-based multidimensional Markovian models are discussed in detail together with implementation issues. Case studies are provided to explain concepts and motivate use of methods. Having grown out of research from the past twenty years, this book expands upon the author's previously published book Analyzing Markov Chains using Kronecker Products (Springer, 2012). The subject matter is interdisciplinary and at the intersection of applied mathematics and computer science. The book will be of use to researchers and graduate students with an understanding of basic linear algebra, probability, and

discrete mathematics.

Symmetrical Analysis Techniques for Genetic Systems and Bioinformatics: Advanced Patterns and Applications - Petoukhov, Sergey 2009-10-31

"This book compiles studies that demonstrate effective approaches to the structural analysis of genetic systems and bioinformatics"--Provided by publisher.