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KEY=OF - AMAYA EVELYN

Methods for Partial Differential Equations

Qualitative Properties of Solutions, Phase Space Analysis, Semilinear Models

Birkhäuser This book provides an overview of different topics related to the theory of partial differential equations. Selected exercises are included at the end of each chapter to prepare readers for the "research project for beginners" proposed at the end of the book. It is a valuable resource for advanced graduates and undergraduate students who are interested in specializing in this area. The book is organized in five parts: In Part 1 the authors review the basics and the mathematical prerequisites, presenting two of the most fundamental results in the theory of partial differential equations: the Cauchy-Kovalevskaja theorem and Holmgren's uniqueness theorem in its classical and abstract form. It also introduces the method of characteristics in detail and applies this method to the study of Burger's equation. Part 2 focuses on qualitative properties of solutions to basic partial differential equations, explaining the usual properties of solutions to elliptic, parabolic and hyperbolic equations for the archetypes Laplace equation, heat equation and wave equation as well as the different features of each theory. It also discusses the notion of energy of solutions, a highly effective tool for the treatment of non-stationary or evolution models and shows how to define energies for different models. Part 3 demonstrates how phase space analysis and interpolation techniques are used to prove decay estimates for solutions on and away from the conjugate line. It also examines how terms of lower order (mass or dissipation) or additional regularity of the data may influence expected results. Part 4 addresses semilinear models with power type non-linearity of source and absorbing type in order to determine critical exponents: two well-known critical exponents, the Fujita exponent and the Strauss exponent come into play. Depending on concrete models these critical exponents divide the range of admissible powers in classes which make it possible to prove quite different qualitative properties of solutions, for example, the stability of the zero solution or blow-up behavior of local (in time) solutions. The last part features selected research projects and general background material.

Artificial Intelligence in the Pacific Rim

IOS Press In the last decade, AI firmly settled into our industrial society with the expert systems as the representative product. However, almost every one of the systems could cover only a single task domain. In the highly mechanized world of the 21st century, systems will become smart and user friendly enough to cover a wide range of task domains. Systems with much user friendliness must be multilingual because users in different domains usually have different languages. Language is formed in its own culture. Therefore, promotion for cross-cultural scientific interchange will be indispensable for the progress of AI.

Anomalies in Partial Differential Equations

Springer Nature The contributions contained in the volume, written by leading experts in their respective fields, are expanded versions of talks given at the INDAM Workshop "Anomalies in Partial Differential Equations" held in September 2019 at the Istituto Nazionale di Alta Matematica, Dipartimento di Matematica "Guido Castelnuovo", Università di Roma "La Sapienza". The volume contains results for well-posedness and local solvability for linear models with low regular coefficients. Moreover, nonlinear dispersive models (damped waves, p -evolution models) are discussed from the point of view of critical exponents, blow-up phenomena or decay estimates for Sobolev solutions. Some contributions are devoted to models from applications as traffic flows, Einstein-Euler systems or stochastic PDEs as well. Finally, several contributions from Harmonic and Time-Frequency Analysis, in which the authors are interested in the action of localizing operators or the description of wave front sets, complete the volume.

New Tools for Nonlinear PDEs and Application

Springer This book features a collection of papers devoted to recent results in nonlinear partial differential equations and applications. It presents an excellent source of information on the state-of-the-art, new methods, and trends in this topic and related areas. Most of the contributors presented their work during the sessions "Recent progress in evolution equations" and "Nonlinear PDEs" at the 12th ISAAC congress held in Växjö, Sweden. Even if inspired by this event, this book is not merely a collection of proceedings, but a stand-alone project gathering original contributions from active researchers on the latest trends in nonlinear evolution PDEs.

Handbook of Numerical Analysis

Gulf Professional Publishing

A First Course in the Qualitative Theory of Differential Equations

This book provides a complete analysis of those subjects that are of fundamental importance to the qualitative theory of differential equations and related to current research—including details that other books in the field tend to overlook. Chapters 1–7 cover the basic qualitative properties concerning existence and uniqueness, structures of solutions, phase portraits, stability, bifurcation and chaos. Chapters 8–12 cover stability, dynamical systems, and bounded and periodic solutions. A good reference book for teachers, researchers, and other professionals.

Probabilistic Analysis and Related Topics

Elsevier Probabilistic Analysis and Related Topics, Volume 3 focuses on the continuity, integrability, and differentiability of random functions, including operator theory, measure theory, and functional and numerical analysis. The selection first offers information on the qualitative theory of stochastic systems and Langevin equations with multiplicative noise. Discussions focus on phase-space evolution via direct integration, phase-space evolution, linear and nonlinear systems, linearization, and generalizations. The text then ponders on the stability theory of stochastic difference systems and Markov properties for random fields. Topics include Markov property of solutions of stochastic partial differential equations; Markov property for generalized Gaussian random fields; Markov properties for generalized random fields; stochastic stability of nonlinear systems; and linear stochastic systems. The publication examines the method of random contractors and its applications to random nonlinear equations, including integral contractors and applications to random equations; random contractors with random nonlinear majorant functions; and random contractors and application to random nonlinear operator equations. The selection is a valuable reference for mathematicians and researchers interested in the general theory of random functions.

Qualitative Analysis and Control of Complex Neural Networks with Delays

Springer This book focuses on the stability of the dynamical neural system, synchronization of the coupling neural system and their applications in automation control and electrical engineering. The redefined concept of stability, synchronization and consensus are adopted to provide a better explanation of the complex neural network. Researchers in the fields of dynamical systems, computer science, electrical engineering and mathematics will benefit from the discussions on complex systems. The book will also help readers to better understand the theory behind the control technique and its design.

Solitons in Physics, Mathematics, and Nonlinear Optics

Springer Science & Business Media This IMA Volume in Mathematics and its Applications SOLITONS IN PHYSICS, MATHEMATICS, AND NONLINEAR OPTICS is based on the proceedings of two workshops which were an integral part of the 1988-89 IMA program on NONLINEAR WAVES. The workshops focussed on the main parts of the theory of solitons and on the applications of solitons in physics, biology and engineering, with a special concentration on nonlinear optics. We thank the Coordinating Committee: James Glimm, Daniel Joseph, Barbara Keyfitz, An Majda, Alan Newell, Peter Olver, David Sattinger and David Schaeffer for drew planning and implementing the stimulating year-long program. We especially thank the Workshop Organizers for Solitons in Physics and Mathematics, Alan Newell, Peter Olver, and David Sattinger, and for Nonlinear Optics and Plasma Physics, David Kaup and Yuji Kodama for their efforts in bringing together many of the major figures in those research fields in which solitons in physics, mathematics, and nonlinear optics theories are used. A vner Friedman Willard Miller, Jr. PREFACE This volume includes some of the lectures given at two workshops, "Solitons in Physics and Mathematics" and "Solitons in Nonlinear Optics and Plasma Physics" held during the 1988-89 LM. A. year on Nonlinear Waves. Since their discovery by Kruskal and Zabusky in the early 1960's, solitons have had a profound impact on many fields, ranging from engineering and physics to algebraic geometry.

Complex Analysis and Dynamical Systems VI: Part 1: PDE, Differential Geometry, Radon Transform

American Mathematical Soc. This volume contains the proceedings of the Sixth International Conference on Complex Analysis and Dynamical Systems, held from May 19-24, 2013, in Nahariya, Israel, in honor of David Shoikhet's sixtieth birthday. The papers in this volume range over a wide variety of topics in Partial Differential Equations, Differential Geometry, and the Radon Transform. Taken together, the articles collected here provide the reader with a panorama of activity in partial differential equations and general relativity, drawn by a number of leading figures in the field. They testify to the continued vitality of the interplay between classical and modern analysis. The companion volume (Contemporary Mathematics, Volume 667) is devoted to complex analysis, quasiconformal mappings, and complex dynamics. This book is co-published with Bar-Ilan University (Ramat-Gan, Israel).

Analysis of Periodically Time-Varying Systems

Springer Science & Business Media Many of the practical techniques developed for treating systems described by periodic differential equations have arisen in different fields of application; consequently some procedures have not always been known to workers in areas that might benefit substantially from them. Furthermore, recent analytical methods are computationally based so that it now seems an opportune time for an applications-oriented book to be made available that, in a sense, bridges the fields in which equations with periodic coefficients arise and which draws together analytical methods that are implemented readily. This book seeks to fill that role, from a user's and not a theoretician's view. The complexities of periodic systems often demand a computational approach. Matrix treatments therefore are emphasized here although algebraic methods have been included where they are useful in their own right or where they establish properties that can be exploited by the matrix approach. The matrix development given calls upon the nomenclature and treatment of H. D'Angelo, Linear Time Varying Systems: Analysis and Synthesis (Boston: Allyn and Bacon 1970) which deals with time-varying systems in general. It is recommended for its modernity and comprehensive approach to systems analysis by matrix methods. Since the present work is applications-oriented no attempt has been made to be complete theoretically by way of presenting all proofs, existence theorems and so on. These can be found in D'Angelo and classic and well-developed treatises such as McLachlan,

N. W. : Theory and application of Mathieu functions.

A First Course in Functional Analysis

Theory and Applications

Anthem Press This book provides the reader with a comprehensive introduction to functional analysis. Topics include normed linear and Hilbert spaces, the Hahn-Banach theorem, the closed graph theorem, the open mapping theorem, linear operator theory, the spectral theory, and a brief introduction to the Lebesgue measure. The book explains the motivation for the development of these theories, and applications that illustrate the theories in action. Applications in optimal control theory, variational problems, wavelet analysis and dynamical systems are also highlighted. 'A First Course in Functional Analysis' will serve as a ready reference to students not only of mathematics, but also of allied subjects in applied mathematics, physics, statistics and engineering.

Reaction-Diffusion Problems in the Physics of Hot Plasmas

CRC Press The physics of hot plasmas is of great importance for describing many phenomena in the universe and is fundamental for the prospect of future fusion energy production on Earth. Nontrivial results of nonlinear electromagnetic effects in plasmas include the self-organization and self-formation in the plasma of structures compact in time and space. Th

Dynamic Modeling

An Introduction

SAGE Outlines the theory behind, and techniques for, using dynamic modeling, taking the reader through a series of increasingly complex models. At each step, examples are used to clarify applications of different equation models.

Dynamical Systems and Cosmology

Springer Science & Business Media Dynamical systems theory is especially well-suited for determining the possible asymptotic states (at both early and late times) of cosmological models, particularly when the governing equations are a finite system of autonomous ordinary differential equations. In this book we discuss cosmological models as dynamical systems, with particular emphasis on applications in the early Universe. We point out the important role of self-similar models. We review the asymptotic properties of spatially homogeneous perfect fluid models in general relativity. We then discuss results concerning scalar field models with an exponential potential (both with and without barotropic matter). Finally, we discuss the dynamical properties of cosmological models derived from the string effective action. This book is a valuable source for all graduate students and professional astronomers who are interested in modern developments in cosmology.

Computer Algebra in Scientific Computing

18th International Workshop, CASC 2016, Bucharest, Romania, September 19-23, 2016, Proceedings

Springer This book constitutes the proceedings of the 18th International Workshop on Computer Algebra in Scientific Computing, CASC 2016, held in Bucharest, Romania, in September 2016. The 32 papers presented in this volume were carefully reviewed and selected from 39 submissions. They deal with cutting-edge research in all major disciplines of Computer Algebra.

Mathematical Methods for the Natural and Engineering Sciences

World Scientific Publishing Company This book provides a variety of methods required for the analysis and solution of equations which arise in the modeling of phenomena from the natural and engineering sciences. It can be used productively by both undergraduate and graduate students, as well as others who need to learn and understand these techniques. A detailed discussion is also presented for several topics that are usually not included in standard textbooks at this level: qualitative methods for differential equations, dimensionalization and scaling, elements of asymptotics, difference equations, and various perturbation methods. Each chapter contains a large number of worked examples and provides references to the appropriate literature.

Mathematical Methods for the Natural and Engineering Sciences

Second Edition

World Scientific Publishing Company This second edition provides a broad range of methods and concepts required for the analysis and solution of equations which arise in the modeling of phenomena in the natural, engineering, and applied mathematical sciences. It may be used productively by both undergraduate and graduate students, as well as others who wish to learn, understand, and apply these techniques. Detailed discussions are also given for several topics that are not usually included in standard textbooks at this level of presentation: qualitative methods for differential equations, dimensionalization and scaling, elements of asymptotics, difference equations and several perturbation procedures. Further, this second edition includes several new topics covering functional equations, the Lambert-W function, nonstandard sets of periodic functions, and the method of dominant balance. Each chapter contains a large number of worked examples and provides references to the appropriate books and literature. Request Inspection Copy

Tutorials in Motor Behavior I

Elsevier The contributors to this book are all distinguished, internationally-known specialists working in the motor control and learning area. The result is a unique collection of papers that discuss many aspects of this intricate and diverse subject and at the same time manage to provide the reader with a good overview of the major topics.

Mechanical Bodies, Computational Minds

Artificial Intelligence from Automata to Cyborgs

MIT Press Researchers in artificial intelligence and scholars in the humanities consider the past, present, and future of artificial intelligence from a multidisciplinary perspective.

Beyond Einstein Gravity

A Survey of Gravitational Theories for Cosmology and Astrophysics

Springer Science & Business Media **Beyond Einstein's Gravity** is a graduate level introduction to extended theories of gravity and cosmology, including variational principles, the weak-field limit, gravitational waves, mathematical tools, exact solutions, as well as cosmological and astrophysical applications. The book provides a critical overview of the research in this area and unifies the existing literature using a consistent notation. Although the results apply in principle to all alternative gravities, a special emphasis is on scalar-tensor and $f(R)$ theories. They were studied by theoretical physicists from early on, and in the 1980s they appeared in attempts to renormalize General Relativity and in models of the early universe. Recently, these theories have seen a new lease of life, in both their metric and metric-affine versions, as models of the present acceleration of the universe without introducing the mysterious and exotic dark energy. The dark matter problem can also be addressed in extended gravity. These applications are contributing to a deeper understanding of the gravitational interaction from both the theoretical and the experimental point of view. An extensive bibliography guides the reader into more detailed literature on particular topics.

Bioinformatics

Genomics and Post-Genomics

John Wiley & Sons This book is an excellent introductory text describing the use of bioinformatics to analyze genomic and post-genomic data. It has been translated from the original popular French edition, which was based on a course taught at the well-respected École Polytechnique in Palaiseau. This edition has been fully revised and updated by the authors. After a brief introduction to gene structure and sequence determination, it describes the techniques used to identify genes, their protein-coding sequences and regulatory regions. The book discusses the methodology of comparative genomics, using information from different organisms to deduce information about unknown sequences. There is a comprehensive chapter on structure prediction, covering both RNA and protein. Finally, the book describes the complex networks of RNA and protein that exist within the cell and their interactions, ending with a discussion of the simulation approaches that can be used to model these networks. Praise from the reviews: "In context of the new developments the genomic era has brought, **Bioinformatics: Genomics and Post-Genomics** becomes a fundamental and indispensable resource for undergraduate and early graduate students...insightfully authored...will immensely help students...in establishing important foundations while shaping their careers." NEWSLETTER, BRITISH SOCIETY OF CELL BIOLOGY

Qualitative Analysis of Nonsmooth Dynamics

A Simple Discrete System with Unilateral Contact and Coulomb Friction

Elsevier **Qualitative Analysis of Nonsmooth Dynamics: A Simple Discrete System with Unilateral Contact and Coulomb Friction** explores the effects of small and large deformations to understand how shocks, sliding, and stick phases affect the trajectories of mechanical systems. By analyzing these non-regularities successively this work explores the set of equilibria and properties of periodic solutions of elementary mechanical systems, where no classical results issued from the theory of ordinary differential equations are readily available, such as stability, continuation or approximation of solutions. The authors focus on unilateral contact in presence of Coulomb friction and show, in particular, how any regularization would greatly simplify the mathematics but lead to unacceptable physical responses. Explores the effects of small and large deformations to understand how shocks, sliding, and stick phases affect the trajectories of mechanical systems Includes theoretical results concerning the full investigation of the behavior under constant or oscillating loadings, even in the case of the simplest mechanical systems Provides a focus on unilateral contact in presence of Coulomb friction Helps you gain an accurate understanding of

how the transition occurs to ensure the safe use of any machine involving rotating or sliding mechanisms

Advances in Intelligent Data Analysis

Third International Symposium, IDA-99 Amsterdam, The Netherlands, August 9-11, 1999 Proceedings

Springer Science & Business Media This book constitutes the refereed proceedings of the Third International Symposium on Intelligent Data Analysis, IDA-99 held in Amsterdam, The Netherlands in August 1999. The 21 revised full papers and 23 posters presented in the book were carefully reviewed and selected from a total of more than 100 submissions. The papers address all current aspects of intelligent data analysis; they are organized in sections on learning, visualization, classification and clustering, integration, applications and media mining.

Applications of Automata Theory and Algebra

Via the Mathematical Theory of Complexity to Biology, Physics, Psychology, Philosophy, and Games

World Scientific This book was originally written in 1969 by Berkeley mathematician John Rhodes. It is the founding work in what is now called algebraic engineering, an emerging field created by using the unifying scheme of finite state machine models and their complexity to tie together many fields: finite group theory, semigroup theory, automata and sequential machine theory, finite phase space physics, metabolic and evolutionary biology, epistemology, mathematical theory of psychoanalysis, philosophy, and game theory. The author thus introduced a completely original algebraic approach to complexity and the understanding of finite systems. The unpublished manuscript, often referred to as "The Wild Book", became an underground classic, continually requested in manuscript form, and read by many leading researchers in mathematics, complex systems, artificial intelligence, and systems biology. Yet it has never been available in print until now. This first published edition has been edited and updated by Christopher Nehaniv for the 21st century. Its novel and rigorous development of the mathematical theory of complexity via algebraic automata theory reveals deep and unexpected connections between algebra (semigroups) and areas of science and engineering. Co-founded by John Rhodes and Kenneth Krohn in 1962, algebraic automata theory has grown into a vibrant area of research, including the complexity of automata, and semigroups and machines from an algebraic viewpoint, and which also touches on infinite groups, and other areas of algebra. This book sets the stage for the application of algebraic automata theory to areas outside mathematics. The material and references have been brought up to date by the editor as much as possible, yet the book retains its distinct character and the bold yet rigorous style of the author. Included are treatments of topics such as models of time as algebra via semigroup theory; evolution-complexity relations applicable to both ontogeny and evolution; an approach to classification of biological reactions and pathways; the relationships among coordinate systems, symmetry, and conservation principles in physics; discussion of "punctuated equilibrium" (prior to Stephen Jay Gould); games; and applications to psychology, psychoanalysis, epistemology, and the purpose of life. The approach and contents will be of interest to a variety of researchers and students in algebra as well as to the diverse, growing areas of applications of algebra in science and engineering. Moreover, many parts of the book will be intelligible to non-mathematicians, including students and experts from diverse backgrounds.

Foundations Of Mechanics

CRC Press **Foundations of Mechanics** is a mathematical exposition of classical mechanics with an introduction to the qualitative theory of dynamical systems and applications to the two-body problem and three-body problem.

Analytic Research Foundations for the Next-Generation Electric Grid

National Academies Press **Electricity** is the lifeblood of modern society, and for the vast majority of people that electricity is obtained from large, interconnected power grids. However, the grid that was developed in the 20th century, and the incremental improvements made since then, including its underlying analytic foundations, is no longer adequate to completely meet the needs of the 21st century. The next-generation electric grid must be more flexible and resilient. While fossil fuels will have their place for decades to come, the grid of the future will need to accommodate a wider mix of more intermittent generating sources such as wind and distributed solar photovoltaics. Achieving this grid of the future will require effort on several fronts. There is a need for continued shorter-term engineering research and development, building on the existing analytic foundations for the grid. But there is also a need for more fundamental research to expand these analytic foundations. **Analytic Research Foundations for the Next-Generation Electric Grid** provide guidance on the longer-term critical areas for research in mathematical and computational sciences that is needed for the next-generation grid. It offers recommendations that are designed to help direct future research as the grid evolves and to give the nation's research and development infrastructure the tools it needs to effectively develop, test, and use this research.

A Chaotic Hierarchy

World Scientific This collection of articles introduces the idea of a hierarchical order in chaotic systems and natural phenomena. To understand nature, nonlinear sciences use a multidisciplinary perspective. Therefore the book integrates research work of different fields: experimental evidence for the theory drawn from physics, biology and chemistry; theoretical progress in mathematical treatment, numerical techniques and graphical methods of nonlinear sciences; and to not-yet-understood philosophical and fundamental problems related to chaos and cosmos, chaos and quantum mechanics or evolutionary dynamics. Featuring the most recent advances in nonlinear dynamics this collection should provide an indispensable reference source and starting point for further research concerning dynamical and hierarchical chaotic systems. Besides this book is in honor of Professor O E Rössler, one of the pioneers of Chaos Theory, who celebrated his 50th birthday in May 1990. Contents: Hierarchies of Dynamical Systems (M Klein & G Baier) The Chaotic Hierarchy (O E Rössler) Phase Regulation of Coupled Oscillators and Chaos (R H Abraham) Symbolic Dynamics in the Belousov-Zhabotinskii Reaction: From Rössler's Intuition to Experimental Evidence for Shil'nikov's Homoclinic Chaos (F Argoul et al.) Determinism in a World of Non-Invertible Transformations (H Degn) Structural, Functional and Dynamical Hierarchies in Neural Networks (A V Holden) Climbing Up Dynamical Hierarchy (K Kaneko) Chaotic Hierarchy from the One-Dimensional Box-Within-a-Box Bifurcations Structure Properties (Ch Mira) The Peroxidase-Oxidase Reaction: A Case for Chaos in the Biochemistry of the Cell (L F Olsen et al.) Experimental Progress on the Ladder Towards Higher Chaos (J Peinke et al.) Conjugate Pair of Representations in Chaos and Quantum Mechanics (K Tomita) Readership: Mathematicians, mathematical physicists and condensed matter physicists. Keywords: Nonlinear Dynamics; Chaos; Hyperchaos; Dynamic Hierarchies; Ordinary Differential Equations; Bifurcations

Energy Research Abstracts

Introduction to Nonlinear Science

Cambridge University Press The aim of this book is to develop a unified approach to nonlinear science, which does justice to its multiple facets and to the diversity and richness of the concepts and tools developed in this field over the years. Nonlinear science emerged in its present form following a series of closely related and decisive analytic, numerical and experimental developments that took place over the past three decades. It appeals to an extremely large variety of subject areas, but, at the same time, introduces into science a new way of thinking based on a subtle interplay between qualitative and quantitative techniques, topological and metric considerations and deterministic and statistical views.

Special effort has been made throughout the book to illustrate both the development of the subject and the mathematical techniques, by reference to simple models. Each chapter concludes with a set of problems. This book will be of great value to graduate students in physics, applied mathematics, chemistry, engineering and biology taking courses in nonlinear science and its applications.

Optimal Control Theory with Economic Applications

North Holland This book serves not only as an introduction, but also as an advanced text and reference source in the field of deterministic optimal control systems governed by ordinary differential equations. It also includes an introduction to the classical calculus of variations. An important feature of the book is the inclusion of a large number of examples, in which the theory is applied to a wide variety of economics problems. The presentation of simple models helps illuminate pertinent qualitative and analytic points, useful when confronted with a more complex reality. These models cover: economic growth in both open and closed economies, exploitation of (non-) renewable resources, pollution control, behaviour of firms, and differential games. A great emphasis on precision pervades the book, setting it apart from the bulk of literature in this area. The rigorous techniques presented should help the reader avoid errors which often recur in the application of control theory within economics.

Advances in Microlocal and Time-Frequency Analysis

Springer Nature The present volume gathers contributions to the conference Microlocal and Time-Frequency Analysis 2018 (MLTFA18), which was held at Torino University from the 2nd to the 6th of July 2018. The event was organized in honor of Professor Luigi Rodino on the occasion of his 70th birthday. The conference's focus and the contents of the papers reflect Luigi's various research interests in the course of his long and extremely prolific career at Torino University.

Proceedings

Mathematical, physical, and engineering sciences

Advances in Chemical Physics

John Wiley & Sons This series provides the chemical physics field with a forum for critical, authoritative evaluations of advances in every area of the discipline. Volume 131 includes chapters on: Polyelectrolyte Dynamics; Hydrodynamics and Slip at the Liquid-Solid Interface; Structure of Ionic Liquids and Ionic Liquid Compounds: Are Ionic Liquids Genuine Liquids in the Conventional Sense?; Chemical Reactions at Very High Pressure; Classical Description of Nonadiabatic Quantum Dynamics; and Non-Born Oppenheimer Variational Calculations of Atoms and Molecules with Explicitly Correlated Gaussian Basis Functions.

Nuclear Science Abstracts

Advances in Chemical Engineering

Academic Press Advances in Chemical Engineering

Artificial Intelligence in Industrial Decision Making, Control and Automation

Springer Science & Business Media This book is concerned with Artificial Intelligence (AI) concepts and techniques as applied to industrial decision making, control and automation problems. The field of AI has been expanded enormously during the last years due to that solid theoretical and application results have accumulated. During the first stage of AI development most workers in the field were content with illustrations showing ideas at work on simple problems. Later, as the field matured, emphasis was turned to demonstrations that showed the capability of AI techniques to handle problems of practical value. Now, we arrived at the stage where researchers and practitioners are actually building AI systems that face real-world and industrial problems. This volume provides a set of twenty four well-selected contributions that deal with the application of AI to such real-life and industrial problems. These contributions are grouped and presented in five parts as follows: Part 1: General Issues Part 2: Intelligent Systems Part 3: Neural Networks in Modelling, Control and Scheduling Part 4: System Diagnostics Part 5: Industrial Robotic, Manufacturing and Organizational Systems Part 1 involves four chapters providing background material and dealing with general issues such as the conceptual integration of qualitative and quantitative models, the treatment of timing problems at system integration, and the investigation of correct reasoning in interactive man-robot systems.

Chaotic Dynamics

Theory and Applications to Economics

Cambridge University Press The modelling of economic models by means of dynamic systems.

European Control Conference 1995

Volume 4b

European Control Association Proceedings of the European Control Conference 1995, Rome, Italy 5-8 September 1995

The History of Mathematics: A Source-Based Approach, Volume 2

American Mathematical Society The History of Mathematics: A Source-Based Approach is a comprehensive history of the development of mathematics. This, the second volume of a two-volume set, takes the reader from the invention of the calculus to the beginning of the twentieth century. The initial discoverers of calculus are given thorough investigation, and special attention is also paid to Newton's Principia. The eighteenth century is presented as primarily a period of the development of calculus, particularly in differential equations and applications of mathematics. Mathematics blossomed in the nineteenth century and the book explores progress in geometry, analysis, foundations, algebra, and applied mathematics, especially celestial mechanics. The approach throughout is markedly historiographic: How do we know what we know? How do we read the original documents? What are the institutions supporting mathematics? Who are the people of mathematics? The reader learns not only the history of mathematics, but also how to think like a historian. The two-volume set was designed as a textbook for the authors' acclaimed year-long course at the Open University. It is, in addition to being an innovative and insightful textbook, an invaluable resource for students and scholars of the history of mathematics. The authors, each among the most distinguished mathematical historians in the world, have produced over fifty books and earned scholarly and expository prizes from the major mathematical societies of the English-speaking world.