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ACEVEDO SIERRA

Differential Analysis on Complex Manifolds Springer Nature
The present volume comprises survey articles on various fields of Differential-Algebraic Equations (DAEs) which have widespread applications in controlled dynamical systems, especially in mechanical and electrical engineering and a strong relation to (ordinary) differential equations. The individual chapters provide reviews, presentations of the current state of research and new concepts in - History of DAEs - DAE aspects of mechanical multibody systems - Model reduction of DAEs - Observability for DAEs - Numerical Analysis for DAEs The results are presented in an accessible style, making this book suitable not only for active researchers but also for graduate students (with a good knowledge of the basic principles of DAEs) for self-study.
Progress in Differential-Algebraic Equations II European Mathematical Society
This book surveys the differential geometry of varieties with degenerate Gauss maps, using moving frames and exterior differential forms as well as tensor methods. The authors illustrate the structure of varieties with degenerate Gauss maps, determine the singular points and singular varieties, find focal images and construct a classification of the varieties with degenerate Gauss maps.
A Survey of Lie Groups and Lie Algebras with Applications and Computational Methods Springer
This book features selected and peer-reviewed lectures presented at the 3rd Semigroups of Operators: Theory and Applications Conference, held in Kazimierz Dolny, Poland, in October 2018 to mark the 85th birthday of Jan Kisyński. Held every five years, the conference offers a forum for mathematicians using semigroup theory to discover what is happening outside their particular field of research and helps establish new links between various sub-disciplines of semigroup theory, stochastic processes, differential equations and the applied fields. The book is intended for researchers, postgraduate and senior students working in operator theory, partial differential equations, probability and stochastic processes, analytical methods in biology and other natural sciences, optimisation and optimal control. The theory of semigroups of operators is a well-developed branch of functional analysis. Its foundations were laid at the beginning of the 20th century, while Hille and Yosida’s fundamental generation theorem dates back to the forties. The theory was originally designed as a universal language for partial differential equations and stochastic processes but, at the same time, it started to become an independent branch of operator theory. Today, it still has the same distinctive character: it develops rapidly by posing new ‘internal’ questions and, in answering them, discovering new methods that can be used in applications. On the other hand, it is being influenced by questions from PDE’s and stochastic processes as well as from applied sciences such as mathematical biology and optimal control and, as a result, it continually

gathers new momentum. However, many results, both from semigroup theory itself and the applied sciences, are phrased in discipline-specific languages and are hardly known to the broader community.

Functional Differential Equations SIAM

The present volume comprises survey articles on various fields of Differential-Algebraic Equations (DAEs), which have widespread applications in controlled dynamical systems, especially in mechanical and electrical engineering and a strong relation to (ordinary) differential equations. The individual chapters provide reviews, presentations of the current state of research and new concepts in - Flexibility of DAE formulations - Reachability analysis and deterministic global optimization - Numerical linear algebra methods - Boundary value problems The results are presented in an accessible style, making this book suitable not only for active researchers but also for graduate students (with a good knowledge of the basic principles of DAEs) for self-study.

Surveys in Applied Mathematics Springer Science & Business Media

The need for a rigorous mathematical theory for Differential-Algebraic Equations (DAEs) has its roots in the widespread applications of controlled dynamical systems, especially in mechanical and electrical engineering. Due to the strong relation to (ordinary) differential equations, the literature for DAEs mainly started out from introductory textbooks. As such, the present monograph is new in the sense that it comprises survey articles on various fields of DAEs, providing reviews, presentations of the current state of research and new concepts in - Controllability for linear DAEs - Port-Hamiltonian differential-algebraic systems - Robustness of DAEs - Solution concepts for DAEs - DAEs in circuit modeling. The results in the individual chapters are presented in an accessible style, making this book suitable not only for active researchers but also for graduate students (with a good knowledge of the basic principles of DAEs) for self-study.

Surveys in Differential Geometry Springer

Partial differential equations play a central role in many branches of science and engineering. Therefore it is important to solve problems involving them. One aspect of solving a partial differential equation problem is to show that it is well-posed, i. e. , that it has one and only one solution, and that the solution depends continuously on the data of the problem. Another aspect is to obtain detailed quantitative information about the solution. The traditional method for doing this was to find a representation of the solution as a series or integral of known special functions, and then to evaluate the series or integral by numerical or by asymptotic methods. The shortcoming of this method is that there are relatively few problems for which such representations can be found. Consequently, the traditional method has been replaced by methods for direct solution of problems either numerically or asymptotically. This article is devoted to a particular method, called the "ray method," for the asymptotic solution of problems for linear partial differential equations governing wave propagation. These equations involve a parameter, such as the wavelength. . \, which is small compared to all other lengths in the problem. The ray method is used to construct an asymptotic expansion of the solution which is valid near . . \ = 0,

or equivalently for k = 21r I A near infinity.

Surveys in Differential-Algebraic Equations II Gulf Professional Publishing

This collection of articles from the Independent University of Moscow is derived from the Globus seminars held there. They are given by world authorities, from Russia and elsewhere, in various areas of mathematics and are designed to introduce graduate students to some of the most dynamic areas of mathematical research. The seminars aim to be informal, wide-ranging and forward-looking, getting across the ideas and concepts rather than formal proofs, and this carries over to the articles here. Topics covered range from computational complexity, algebraic geometry, dynamics, through to number theory and quantum groups. The volume as a whole is a fascinating and exciting overview of contemporary mathematics.

Surveys in Differential-Algebraic Equations I World Scientific

This volume consists of invited lecture notes, survey papers and original research papers from the AAGADE school and conference held in Będlewo, Poland in September 2015. The contributions provide an overview of the current level of interaction between algebra, geometry and analysis and demonstrate the manifold aspects of the theory of ordinary and partial differential equations, while also pointing out the highly fruitful interrelations between those aspects. These interactions continue to yield new developments, not only in the theory of differential equations but also in several related areas of mathematics and physics such as differential geometry, representation theory, number theory and mathematical physics. The main goal of the volume is to introduce basic concepts, techniques, detailed and illustrative examples and theorems (in a manner suitable for non-specialists), and to present recent developments in the field, together with open problems for more advanced and experienced readers. It will be of interest to graduate students, early-career researchers and specialists in analysis, geometry, algebra and related areas, as well as anyone interested in learning new methods and techniques.

Surveys in Differential-Algebraic Equations I Princeton University Press

This book comprehensively examines various significant aspects of linear time-invariant systems theory, both for continuous-time and discrete-time. Using a number of new mathematical methods it provides complete and exact proofs of all the systems theoretic and electrical engineering results, as well as important results and algorithms demonstrated with nontrivial computer examples. The book is intended for readers who have completed the first two years of a university mathematics course. All further mathematical results required are proven in the book.

Formal and Analytic Solutions of Diff. Equations Springer Nature

Differential Equations: Theory, Technique, and Practice with Boundary Value Problems presents classical ideas and cutting-edge techniques for a contemporary, undergraduate-level, one- or two-semester course on ordinary differential equations. Authored by a widely respected researcher and teacher, the text covers standard topics such as partial diff

Algebraic and Symbolic Computation Methods in Dynamical Systems Springer Science & Business Media

This collection of papers constitutes a

wide-ranging survey of recent developments in differential geometry and its interactions with other fields, especially partial differential equations and mathematical physics. This area of mathematics was the subject of a special program at the Institute for Advanced Study in Princeton during the academic year 1979-1980; the papers in this volume were contributed by the speakers in the sequence of seminars organized by Shing-Tung Yau for this program. Both survey articles and articles presenting new results are included. The articles on differential geometry and partial differential equations include a general survey article by the editor on the relationship of the two fields and more specialized articles on topics including harmonic mappings, isoperimetric and Poincaré inequalities, metrics with specified curvature properties, the Monge-Arnpere equation, L2 harmonic forms and cohomology, manifolds of positive curvature, isometric embedding, and Kraumlhler manifolds and metrics. The articles on differential geometry and mathematical physics cover such topics as renormalization, instantons, gauge fields and the Yang-Mills equation, nonlinear evolution equations, incompleteness of space-times, black holes, and quantum gravity. A feature of special interest is the inclusion of a list of more than one hundred unsolved research problems compiled by the editor with comments and bibliographical information.

A Survey of Numerical Mathematics Springer Science & Business Media

This book is a study of how a particular vision of the unity of mathematics, often called geometric function theory, was created in the 19th century. The central focus is on the convergence of three mathematical topics: the hypergeometric and related linear differential equations, group theory, and on-Euclidean geometry. The text for this second edition has been greatly expanded and revised, and the existing appendices enriched. The exercises have been retained, making it possible to use the book as a companion to mathematics courses at the graduate level.

Selected Topics in the Geometrical Study of Differential Equations American Mathematical Soc.

A brand new appendix by Oscar Garcia-Prada graces this third edition of a classic work. In developing the tools necessary for the study of complex manifolds, this comprehensive, well-organized treatment presents in its opening chapters a detailed survey of recent progress in four areas: geometry (manifolds with vector bundles), algebraic topology, differential geometry, and partial differential equations. Wells’s superb analysis also gives details of the Hodge-Riemann bilinear relations on Kahler manifolds, Griffiths's period mapping, quadratic transformations, and Kodaira's vanishing and embedding theorems. Oscar Garcia-Prada’s appendix gives an overview of the developments in the field during the decades since the book appeared.

Selected Topics in the Geometrical Study of Differential Equations Springer Science & Business Media

This volume encompasses prototypical, innovative and emerging examples and benchmarks of Differential-Algebraic Equations (DAEs) and their applications, such as electrical networks, chemical reactors, multibody systems, and multiphysics models, to name but a few. Each article begins with an exposition of modelling, explaining whether the model

is prototypical and for which applications it is used. This is followed by a mathematical analysis, and if appropriate, a discussion of the numerical aspects including simulation. Additionally, benchmark examples are included throughout the text. Mathematicians, engineers, and other scientists, working in both academia and industry either on differential-algebraic equations and systems or on problems where the tools and insight provided by differential-algebraic equations could be useful, would find this book resourceful.

A Survey on the Theory of Random Equations Springer Science & Business Media

Volume I of two-volume set offers broad self-contained coverage of computer-oriented numerical algorithms for solving mathematical problems related to linear algebra, ordinary and partial differential equations, and much more. 1972 edition.

Differential-algebraic Equations Courier Corporation

The problem of solving large, sparse, linear systems of algebraic equations is vital in scientific computing, even for applications originating from quite different fields. A Survey of Preconditioned Iterative Methods presents an up to date overview of iterative methods for numerical solution of such systems. Typically, the methods considered are w

A Survey of Preconditioned Iterative Methods Springer Nature

For most of the book the only prerequisites are the basic facts of algebraic geometry and number theory."--BOOK JACKET.

Arithmetic Differential Equations Cambridge University Press

Differential algebra explores properties of solutions of systems of (ordinary or partial, linear or non-linear) differential equations from an algebraic point of view. It includes as special cases algebraic systems as well as differential systems with algebraic constraints. This algebraic theory of Joseph F Ritt and Ellis R Kolchin is further enriched by its interactions with algebraic geometry, Diophantine geometry, differential geometry, model theory, control theory, automatic theorem proving, combinatorics, and difference equations. Differential algebra now plays an important role in computational methods such as symbolic integration and symmetry analysis of differential equations. These proceedings consist of tutorial and survey papers presented at the Second International Workshop on Differential Algebra and Related Topics at Rutgers University, Newark in April 2007. As a sequel to the proceedings of the First International Workshop, this volume covers more related subjects, and provides a modern and introductory treatment to many facets of differential algebra, including surveys of known results, open problems, and new, emerging, directions of research. It is therefore an excellent companion and reference text for graduate students and researchers.

Linear Time-Invariant Systems, Behaviors and Modules Springer

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.

Differential-algebraic Equations and Their Numerical Treatment SIAM

The need for a rigorous mathematical theory for Differential-Algebraic Equations (DAEs) has its roots in the widespread applications of controlled dynamical systems, especially in mechanical and electrical engineering. Due to the strong relation to (ordinary) differential equations, the literature for DAEs mainly started out from introductory textbooks. As such, the present monograph is new in the sense that it comprises survey articles on various fields of DAEs, providing reviews, presentations of the current state of research and new concepts in - Controllability for linear DAEs - Port-Hamiltonian differential-algebraic systems - Robustness of DAEs - Solution concepts for DAEs - DAEs in circuit modeling. The results in the individual chapters are presented in an accessible style, making this book suitable not only for active researchers but also for graduate students (with a good knowledge of the basic principles of DAEs) for self-study.