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Nonautonomous Dynamics Springer Science & Business Media

The Handbook of Personality Dynamics and Processes is a primer to the basic and most important concepts, theories, methods, empirical findings, and applications of personality dynamics and processes. This book details how personality psychology has evolved from descriptive research to a more explanatory and dynamic science of personality, thus bridging structure- and process-based approaches, and it also reflects personality psychology ' s interest in the dynamic organization and interplay of thoughts, feelings, desires, and actions within persons who are always embedded into social, cultural and historic contexts. The Handbook of Personality Dynamics and Processes tackles each topic with a range of methods geared towards assessing and analyzing their dynamic nature, such as ecological momentary sampling of personality manifestations in real-life; dynamic modeling of time-series or longitudinal personality data; network modeling and simulation; and systems-theoretical models of dynamic processes. Ties topics and methods together for a more dynamic understanding of personality Summarizes existing knowledge and insights of personality dynamics and processes Covers a broad compilation of cutting-edge insights Addresses the biophysiological and social mechanisms underlying the expression and effects of personality Examines within-person consistency and variability

IUTAM Symposium on New Applications of Nonlinear and Chaotic Dynamics in Mechanics Princeton University Press

Collection of technical papers presented at the 5th International Conference on Stochastic Structural Dynamics (SSD03) in Hangzhou, China during May 26-28, 2003. Topics include direct transfer substructure method for random response analysis, generation of bounded stochastic processes, and sample path behavior of Gaussian processes.

Structural Dynamics in Engineering Design CRC Press

The IUTAM Symposium on Advances in Nonlinear Stochastic Mechanics, held in Trondheim July 3-7, 1995, was the eighth of a series of IUTAM sponsored symposia which focus on the application of stochastic methods in mechanics. The previous meetings took place in Coventry, UK (1972), Sout'hampton, UK (1976), FrankfurtjOder, Germany (1982), Stockholm, Sweden (1984), Innsbruckjlgls, Austria (1987), Turin, Italy (1991) and San Antonio, Texas (1993). The symposium provided an extraordinary opportunity for scholars to meet and discuss recent advances in stochastic mechanics. The participants represented a wide range of expertise, from pure theoreticians to people primarily oriented toward applications. A significant achievement of the symposium was the very extensive discussions taking place over the whole range from highly theoretical questions to practical engineering applications. Several presentations also clearly demonstrated the substantial progress that has been achieved in recent years in terms of developing and implement ing stochastic analysis techniques for mechanical engineering systems. This aspect was further underpinned by specially invited extended lectures on computational stochastic mechanics, engineering applications of stochastic mechanics, and nonlinear active control. The symposium also reflected the very active and high-quality research taking place in the field of stochastic stability. Ten presentations were given on this topic ofa total of47 papers. A main conclusion that can be drawn from the proceedings of this symposium is that stochastic mechanics as a subject has reached great depth and width in both methodology and applicability.

Nonlinear Dynamics of Piecewise Constant Systems and Implementation of Piecewise Constant Arguments Springer Science & Business Media

This volume studies the dynamics of iterated holomorphic mappings from a Riemann surface to itself, concentrating on the classical case of rational maps of the Riemann sphere. This subject is large and rapidly growing. These lectures are intended to introduce some key ideas in the field, and to form a basis for further study. The reader is assumed to be familiar with the rudiments of complex variable theory and of two-dimensional differential geometry, as well as some basic topics from topology. This third edition contains a number of minor additions and improvements: A historical survey has been added, the definition of Latt é s map has been made more inclusive, and the é calle-Voronin theory of parabolic points is described. The r é sidu it é ratif is studied, and the material on two complex variables has been expanded. Recent results on effective computability have been added, and the references have been expanded and updated. Written in his usual brilliant style, the author makes difficult mathematics look easy. This book is a very accessible source for much of what has been accomplished in the field.

Dynamics of the Rigid Solid with General Constraints by a Multibody Approach Springer

The scope of the present book is to offer the most efficient tools for the vectorization of serial computer programs. Here, by vectorization we understand the adaptation of computer programs to the special architecture of modern available vector computers to exploit fully their potential, which

will often result in remarkable performance improvements. The book is written primarily for users working in the various fields of computational physics, for scientists as well as for programmers running their jobs on a vector computer. The text may, however, also be of value to those who are interested in numerical algorithms. Although the examples discussed in chapter 9 have been taken from Computational Fluid Dynamics, the numerical methods are well-known, and are applied in many fields of Computational Physics. The book is divided into four parts. After a short introduction which outlines the limits of conventional serial computers in contrast to the possibilities offered by the new vector machines, the second part is addressed to the discussion of some main features of existing computer architectures. We restrict ourselves to the vector computers CRAY-1S and CDC-CYBER 205, although, in the meantime, many vector and parallel computers and array processors are available such as DENELCOR's Heterogeneous Element Processor (HEP), ICL's Distributed Array Processor (DAP), SPERRY UNIVAC's Array Processing System (APS), STAR TECHNOLOGIES ST-l00, FLOATING POINT SYSTEMS' Array Processor (FPS), FUJITSU's FACOM VP-l00 and VP-200, HITACHI's Integrated Array Processor (lAP), HITACHI's S 810/10 and S 810/20 and others.

Probabilistic Theory of Structures CRC Press

Nonlinear Dynamics represents a wide interdisciplinary area of research dealing with a variety of “ unusual ” physical phenomena by means of nonlinear differential equations, discrete mappings, and related mathematical algorithms. However, with no real substitute for the linear superposition principle, the methods of Nonlinear Dynamics appeared to be very diverse, individual and technically complicated. This book makes an attempt to find a common ground for nonlinear dynamic analyses based on the existence of strongly nonlinear but quite simple counterparts to the linear models and tools. It is shown that, since the subgroup of rotations, harmonic oscillators, and the conventional complex analysis generate linear and weakly nonlinear approaches, then translations and reflections, impact oscillators, and hyperbolic (Clifford ’ s) algebras must give rise to some “ quasi impact ” methodology. Such strongly nonlinear methods are developed in several chapters of this book based on the idea of non-smooth time substitutions. Although most of the illustrations are based on mechanical oscillators, the area of applications may include also electric, electro-mechanical, electrochemical and other physical models generating strongly anharmonic temporal signals or spatial distributions. Possible applications to periodic elastic structures with non-smooth or discontinuous characteristics are outlined in the final chapter of the book.

Intelligent Interactive Multimedia Systems and Services Routledge

This volume presents a series of carefully selected papers on the theme of Intelligent Interactive Multimedia Systems and Services (IIMSS-18), but also including contributions on Innovation in Medicine and Healthcare (InMed-18) and Smart Transportation Systems (STS-18). The papers were presented at the Smart Digital Futures 2018 multi-theme conference, which grouped the AMSTA, IDT, InMed, SEEL, STS and IIMSS conferences in one venue in Gold Coast, Australia in June 2018. IIMSS-18 included sessions on 'Cognitive Systems and Big Data Analytics', 'Data Processing and Secure Systems', 'Innovative Information Services for Advanced Knowledge Activity', 'Autonomous System' and ' Image Processing'. InMed-18 papers cover major areas of 'Digital Architecture for Internet of Things, Big data, Cloud and Mobile IT in Healthcare' and 'Advanced ICT for Medical and Healthcare'. STS-18 papers provide a comprehensive overview of various aspects of current research into intelligent transportation technology.

Nonlinear Random Vibration World Scientific

Piecewise constant systems exist in widely expanded areas such as engineering, physics, and mathematics. Extraordinary and complex characteristics of piecewise constant systems have been reported in recent years. This book provides the methodologies for analyzing and assessing nonlinear piecewise constant systems on a theoretically and practically sound basis. Recently developed approaches for theoretically analyzing and numerically solving the nonlinear piecewise constant dynamic systems are reviewed. A new greatest integer argument with a piecewise constant function is utilized for nonlinear dynamic analyses and for establishing a novel criterion in diagnosing irregular and chaotic solutions from the regular solutions of a nonlinear dynamic system. The newly established piecewise constantization methodology and its implementation in analytically solving for nonlinear dynamic problems are also presented.

Advanced Dynamics Ashgate Publishing, Ltd.

World-class authors describe and illustrate how structural dynamics is applied to the engineering design process Structural Dynamics in Engineering Design covers the fundamentals of structural dynamics and its application to the engineering design process, providing all of the necessary information to implement an optimal design process. Each of its seven chapters is written by an expert in the field and provides the reader with the structural dynamic theoretical background and its more practical aspects for the implementation of an advanced design capability. The first three chapters are dedicated to the underlying theory of the three main processes: the fundamentals of vibration theory, the basis of experimental dynamics and the main numerical analysis tools (including reference to the finite element method). Having laid the foundation of the design philosophy, the following three chapters present the reader with the three disciplines of identification, nonlinear analysis and validation/updating. The final chapter presents some applications of the approach to real and complex engineering cases. Key features: Takes a multi-disciplinary approach and contains critical information on theory, testing and numerical analysis for structural dynamics. Includes a chapter on industrial applications (including aircraft design and ground vibration testing), which illustrates the design process and explains how structural dynamics is applied at different stages. The book is a must-have for researchers and practitioners in mechanical and aerospace engineering (in particular test engineers, CAE analysts and structural dynamicists), as well as graduate students in mechanical and aerospace engineering departments.

IUTAM Symposium on Advances in Nonlinear Stochastic Mechanics John Wiley & Sons

A thorough understanding of rigid body dynamics as it relates to modern mechanical and aerospace systems requires engineers to be well versed in a variety of disciplines. This book offers an all-encompassing view by interconnecting a multitude of key areas in the study of rigid body dynamics, including classical mechanics, spacecraft dynamics, and multibody dynamics. In a clear, straightforward style ideal for learners at any level, Advanced Dynamics builds a solid fundamental base by first providing an in-depth review of kinematics and basic dynamics before ultimately moving forward to tackle advanced subject areas such as rigid body and Lagrangian dynamics. In addition, Advanced Dynamics: Is the only book that bridges the gap between rigid body, multibody, and spacecraft dynamics for graduate students and specialists in mechanical and aerospace engineering Contains coverage of special applications that highlight the different aspects of dynamics and enhances understanding of advanced systems across all related disciplines Presents material using the author's own theory of differentiation in different coordinate frames, which allows for better understanding and application by students and professionals Both a refresher and a professional resource, Advanced Dynamics leads readers on a rewarding educational journey that will allow them to expand the scope of their engineering acumen as they apply a wide range of applications across many different engineering disciplines.

Vehicle Vibrations Springer Science & Business Media

Analysis and control of time-delayed systems have been applied in a wide range of applications, ranging from mechanical, control, economic, to biological systems. Over the years, there has been a steady stream of interest in time-delayed dynamic systems, this book takes a snap shot of recent research from the world leading experts in analysis and control of dynamic systems with time delay to provide a bird's eye view of its development. The topics covered in this book include solution methods, stability analysis and control of periodic dynamic systems with time delay, bifurcations, stochastic dynamics and control, delayed Hamiltonian systems, uncertain dynamic systems with time delay, and experimental investigations of delayed structural control. Contents:Complete Quadratic Lyapunov-Krasovskii Functional: Limitations, Computational Efficiency, and Convergence (Keqin Gu)Recent Approaches for

the Numerical Solution of State-Dependent Delay Differential Equations with Discontinuities (Alfredo Bellen)Engineering Applications of Time-Periodic Time-Delay Systems (G á bor St é p á n)Synchronization in Delay-Coupled Complex Networks (Eckehard Sch ö ll)Stochastic Dynamics and Optimal Control of Quasi Integrable Hamiltonian Systems with Time-Delayed Feedback Control (Weiqiu Zhu and Zhonghua Liu)Delay Induced Strong and Weak Resonances in Delayed Differential Systems (Jian Xu, Wanyong Wang)Stability and Hopf Bifurcation of Time-Delay Systems with Complex Coefficients (Zaihua Wang and Junyu Li)Estimation and Control in Time-Delayed Dynamical Systems Using the Chebyshev Spectral Continuous Time Approximation and Reduced Liapunov-Floquet Transformation (Eric A Butcher, Oleg Bobrenkov, Morad Nazari and Shahab Torkamani)Noise-Induced Dynamics of Time-Delayed Stochastic Systems (Yanfei Jin and Haiyan Hu)Some Studies on Delayed System Dynamics and Control (Guo-Pingcai, Long-Xiang Chen and Kun Liu)Switching Control of Uncertain Dynamic Systems with Time Delay (Jian-Qiao Sun, Xiao-Yan Zhang, Zhi-Chang Qin and Shun Zhong) Readership: The researchers in the community of dynamics and control including mechanical, civil, structural, aerospace, naval and electrical engineers. Graduate students pursuing research in the area of dynamics and control. Keywords:Time-Delayed Dynamical Control Systems;Stochastic Dynamics and Optimal Control SystemsKey Features:Professor Jian-Qiao Sun, of University of California-Merced is well-known for his work on stochastic nonlinear dynamical systems and cell mapping methodsProfessor Qian Ding of Tianjin University is well-known for his work on nonlinear dynamics, rotor dynamics and reduced order modeling of complex dynamical systemsThere are many books devoted to time delayed systems, as noted in the authors' proposal, but many don't do justice to control. In addition, the topic of time delayed, non-smooth systems is beginning to receive considerable attention in the literature, but not (well) addressed in any of the current books

A Numerical Solution for the Interaction of a Moving Shock Wave with a Turbulent Mixing Region Academic Press

Modern Fluid Dynamics, Second Edition provides up-to-date coverage of intermediate and advanced fluids topics. The text emphasizes fundamentals and applications, supported by worked examples and case studies. Scale analysis, non-Newtonian fluid flow, surface coating, convection heat transfer, lubrication, fluid-particle dynamics, microfluidics, entropy generation, and fluid-structure interactions are among the topics covered. Part A presents fluids principles, and prepares readers for the applications of fluid dynamics covered in Part B, which includes computer simulations and project writing. A review of the engineering math needed for fluid dynamics is included in an appendix.

Computational Stochastic Mechanics CRC Press

Addresses fundamentals and advanced topics relevant to the behavior of materials under in-service conditions such as impact, shock, stress and high-strain rate deformations. Deals extensively with materials from a microstructure perspective which is the future direction of research today.

Introduction to Structural Dynamics Springer Science & Business Media

This book emphasizes those topological methods (of dynamical systems) and theories that are useful in the study of different classes of nonautonomous evolutionary equations. The content is developed over six chapters, providing a thorough introduction to the techniques used in the Chapters III-VI described by Chapter I-II. The author gives a systematic treatment of the basic mathematical theory and constructive methods for Nonautonomous Dynamics. They show how these diverse topics are connected to other important parts of mathematics, including Topology, Functional Analysis and Qualitative Theory of Differential/Difference Equations. Throughout the book a nice balance is maintained between rigorous mathematics and applications (ordinary differential/difference equations, functional differential equations and partial difference equations). The primary readership includes graduate and PhD students and researchers in in the field of dynamical systems and their applications (control theory, economic dynamics, mathematical theory of climate, population dynamics, oscillation theory etc).

The Handbook of Personality Dynamics and Processes Springer Nature

This book gathers the latest advances and innovations in the field of quality control and improvement of bridges and structures, as presented by international researchers and engineers at the 1st Conference of the European Association on Quality Control of Bridges and Structures (EUROSTRUCT 2021), held in Padua, Italy on August 29 – September 1, 2021. Contributions include a wide range of topics such as testing and advanced diagnostic techniques for damage detection; SHM and AI, IoT and machine learning for data analysis of bridges and structures; fiberoptics and smart sensors for long-term SHM; structural reliability, risk, robustness, redundancy and resilience for bridges; corrosion models, fatigue analysis and impact of hazards on infrastructure components; bridge and asset management systems, and decision-making models; Life-Cycle Analysis, retrofit and service-life extension, risk management protocols; quality control plans, sustainability and green materials.

Kinematics and Dynamics of Mechanical Systems SAE International

A modern vector oriented treatment of classical dynamics and its application to engineering problems.

Engineering Dynamics Springer Science & Business Media

This unique textbook takes the student from the initial steps in modeling a dynamic system through development of the mathematical models needed for feedback control. The generously-illustrated, student-friendly text focuses on fundamental theoretical development rather than the application of commercial software. Practical details of machine design are included to motivate the non-mathematically inclined student.

Dynamic Behavior of Materials Cambridge University Press

Interest in water will continue to grow for a long time to come. It will continue to spread over a large number of disciplines and technologies. Research into water in all its aspects has become so diverse that even those with a direct interest find it impossible to keep up with the original literature beyond a very limited range. On the other hand, scientists want to keep in touch with a wide spectrum of basic and applied research on water and the role played by aqueous solvents in physical, chemical, biological, technological and environmental processes. Water Science Reviews contains three or four critical reviews of the type previously published in the seven volume work Water - A Comprehensive Treatise. Some reviews update previously published topics while others feature areas of Water Sciences that have never yet been reviewed. A common focus is the central position adopted by water in the systems and processes described.

Modern Fluid Dynamics CRC Press

Well-written introduction covers the elements of the theory of probability from two or more random variables, the reliability of such multivariable structures, the theory of random function, Monte Carlo methods of treating problems incapable of exact solution, and more. No previous knowledge of the subject necessary. Numerous examples, illustrative figures.

Signal Springer Nature

This book addresses how economic spaces dynamically change within the context of the global knowledge-based economy. Specifically, it centers the discussion on integrated views of understanding and conceptualizing dynamic changes of global economy under the global megatrends of globalization, knowledge-based economy, information society, service world, climate change, and population aging. Focusing on East Asia, especially on Korea, it deals with case studies regarding the processes and patterns of these global dynamics, looking at economic spaces of various spatial scales and types of economic actors. This book develops a theoretical model for understanding and analysing the dynamics of economic spaces that are being reshaped within the larger global economy. It also emphasizes the analysis of empirical studies at the level of firm, region,

and state by considering an evolutionary perspective over time. In developing its theoretical framework, this book examines regional resilience, intangible assets, service innovation, path dependence, and other notions related to the evolution of economic spaces, and incorporates these elements into real-world case studies. The integrated theoretical framework examined here contributes a new perspective on spatial disparities in the global economy. An integral model of service innovation; the integration of path dependence and regional resilience; the interaction between firm and region for the accumulation of intangible assets; and the roles of governments and global firms: these are all essential to understanding the dynamics of economic spaces in East Asia. The theoretical model and case studies in this book suggest policy implications for developing countries, especially in the Asian and African regions, with regard to regional development and innovation policies.