Full Version Meirovitch Solution Manual Fundamentals Vibration

A thorough study of the oscillatory and transient motion of mechanical and structural systems, Engineering Vibrations, Second Edition presents vibrations from a unified point of view, and builds on the first edition with additional chapters and sections that contain more advanced, graduate-level topics. Using numerous examples and case studies to r

This classic text combines the scholarly insights of its distinguished author with the practical, problem-solving orientation of an experienced industrial engineer. Abundant examples and figures, plus 233 problems and answers. 1956 edition.

Mechanical Vibration: Analysis, Uncertainties, and Control simply and comprehensively addresses the fundamental principles of vibration theory, emphasizing its application in solving practical engineering problems. The authors focus on strengthening engineers' command of mathematics as a cornerstone for understanding vibration, control, and the ways in which uncertainties affect analysis. It provides a detailed exploration and explanation of the essential equations involved in modeling vibrating systems and shows readers how to employ MATLAB® as an advanced tool for analyzing specific problems. Forgoing the extensive and in-depth analysis of randomness and control found in more specialized texts, this straightforward, easy-to-follow volume presents the format, content, and depth of description that the authors themselves would have found useful when they first learned the subject. The authors assume that

the readers have a basic knowledge of dynamics, mechanics of materials, differential equations, and some knowledge of matrix algebra. Clarifying necessary mathematics, they present formulations and explanations to convey significant details. The material is organized to afford great flexibility regarding course level, content, and usefulness in self-study for practicing engineers or as a text for graduate engineering students. This work includes example problems and explanatory figures, biographies of renowned contributors, and access to a website providing supplementary resources. These include an online MATLAB primer featuring original programs that can be used to solve complex problems and test solutions.

Control and Dynamic Systems: Advances in Theory in Applications, Volume 32: Advances in Aerospace Systems Dynamics and Control Systems, Part 2 of 3 deals with significant advances in technologies which support the development of aerospace systems. It also presents several algorithms and computational techniques used in complex aerospace systems. After discussing flight management systems (FMS), this volume presents techniques for treating complex aerospace systems models. These techniques include parameter identification, asymptotic perturbation method, reliability techniques, constrained optimization techniques, and computation methods for decoy discrimination and optimal targeting. This book is an excellent reference for research and professional workers in the field who want a comprehensive source of techniques with significant applied implications.

Mechanical Vibrations

Advanced Applications in Acoustics, Noise and Vibration

Introduction to Space Dynamics

Presented at the Winter Annual Meeting of the American Society of Mechanical Engineers, Anaheim, California, November 8-13, 1992

Introduction to Dynamics and Control

A revised and up-to-date guide to advanced vibration analysis written by a noted expert The revised and updated second edition of Vibration of Continuous Systems offers a guide to all aspects of vibration of continuous systems including: derivation of equations of motion, exact and approximate solutions and computational aspects. The author—a noted expert in the field—reviews all possible types of continuous structural members and systems including strings, shafts, beams, membranes, plates, shells, three-dimensional bodies, and composite structural members. Designed to be a useful aid in the understanding of the vibration of continuous systems, the book contains exact analytical solutions, approximate analytical solutions, and numerical solutions. All the methods are presented in clear and simple terms and the second edition offers a more detailed explanation of the fundamentals and basic concepts. Vibration of Continuous Systems revised second edition: Contains new chapters on Vibration of three-dimensional solid bodies; Vibration of composite structures; and Numerical solution using the finite element method Reviews the fundamental concepts in clear and concise language

Includes newly formatted content that is streamlined for effectiveness Offers many new illustrative examples and problems Presents answers to selected problems Written for professors, students of mechanics of vibration courses, and researchers, the revised second edition of Vibration of Continuous Systems offers an authoritative guide filled with illustrative examples of the theory, computational details, and applications of vibration of continuous systems.

Thisbook will be of interest to mechanical engineers, aerospace engineers, and engineering science and mechanics faculty. The main objective of the book is to present a mathematically rigorous approach to vibrations, one that not only permits efficient formulations and solutions to problems, but also enhances understanding of the physics of the problem. The book takes a very broad view approach to the subject so that the similarity of dynamic characteristics of vibrating systems will be understood.

“Collaborative Product and Service Life Cycle Management for a Sustainable World” gathers together papers from the 15th ISPE International Conference on Concurrent Engineering (CE2008), to stimulate the new thinking that is so crucial to our sustained productivity enhancement and quality of life. It is already evident in this new century that the desire for sustainable development is increasingly driving the market to reach for new and innovative solutions that more effectively utilize the resources we have inherited from previous generations; with the obvious responsibility to future generations. Human

productivity and progress can be positively engineered and managed in harmony with the provision and needs of our natural environment. One century on from the industrial revolution, this is now the time of the sustainable revolution; requiring holistic technological, process and people integrated solutions to sustained socio-economic enhancement.

Every so often, a reference book appears that stands apart from all others, destined to become the definitive work in its field. The Vibration and Shock Handbook is just such a reference. From its ambitious scope to its impressive list of contributors, this handbook delivers all of the techniques, tools, instrumentation, and data needed to model, analyze, monitor, modify, and control vibration, shock, noise, and acoustics. Providing convenient, thorough, up-to-date, and authoritative coverage, the editor summarizes important and complex concepts and results into “snapshot” windows to make quick access to this critical information even easier. The Handbook’s nine sections encompass fundamentals and analytical techniques; computer techniques, tools, and signal analysis; shock and vibration methodologies; instrumentation and testing; vibration suppression, damping, and control; monitoring and diagnosis; seismic vibration and related regulatory issues; system design, application, and control implementation; and acoustics and noise suppression. The book also features an extensive glossary and convenient cro referencing, plus references at the end of each chapter. Brimming with illustrations,

equations, examples, and case studies, the Vibration and Shock Handbook is the most extensive, practical, and comprehensive reference in the field. It is a must-have for anyone, beginner or expert, who is serious about investigating and controlling vibration and acoustics.

Proceedings of the 15th ISPE International Conference on Concurrent Engineering (CE2008)

Engineering Vibrations

Methods of Analytical Dynamics

Vibration with Control

Structronic Systems: Smart Structures, Devices and Systems

Phenomena, Modeling, and Analysis

Understanding and controlling vibration is critical for reducing noise, improving work environments and product quality, and increasing the useful life of industrial machinery and other mechanical systems. Computer-based modeling and analytical tools provide fast, accurate, and efficient means of designing and controlling a system for improved vibratory and, subsequently, acoustic performance. Computer Techniques in Vibration provides an overview as well as a detailed account and application of the various tools and techniques available for modeling and simulating vibrations. Drawn from the immensely popular

Vibration and Shock Handbook, each expertly crafted chapter of this book includes convenient summary windows, tables, graphs, and lists to provide ready access to the important concepts and results. Working systematically from general principles to specific applications, the coverage spans from numerical techniques, modeling, and software tools to analysis of flexibly supported multibody systems, finite element applications, vibration signal analysis, fast Fourier transform (FFT), and wavelet techniques and applications. MATLAB® toolboxes and other widely available software packages feature prominently in the discussion, accompanied by numerous examples, sample outputs, and a case study. Instead of wading through heavy volumes or software manuals for the techniques you need, find a ready collection of eminently practical tools in Computer Techniques in Vibration.

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

The treatment of uncertainties in the analysis of engineering structures remains one of the premium challenges in modern structural mechanics. It is only in recent years that the developments in stochastic and deterministic computational mechanics began to be synchronized. To foster these developments, novel computational procedures for the uncertainty assessment of large finite element systems are presented in this monograph. The stochastic

input is modeled by the so-called Karhunen-Loève expansion, which is formulated in this context both for scalar and vector stochastic processes as well as for random fields. Particularly for strongly non-linear structures and systems the direct Monte Carlo simulation technique has proven to be most advantageous as method of solution. The capabilities of the developed procedures are demonstrated by showing some practical applications.

Intended for introductory vibrations courses, Meirovitch offers a masterfully crafted textbook that covers all basic concepts at a level appropriate for undergraduate students. The book contains a chapter on the use of Finite Element Methods in vibrational analysis. Meirovitch uses selective worked examples to show the application of MATLAB software in this course. The author's approach challenges students with a precise and thoughtful explanations and motivates them through use of physical explanations, plentiful problems, worked-out examples, and illustrations.

Engineering Dynamics

Robot Manipulators

Elements of Vibration Analysis

The Oldest Guard

Palestine Jewry and the Arab Question, 1917-1925 (RLE Israel and Palestine)

On the Example of Spherical Shells

Comprehensive, classic introduction to space-flight engineering for advanced undergraduate and graduate students provides basic tools for quantitative analysis of the motions of satellites and other vehicles in space. Advanced Applications in Acoustics, Noise and Vibration provides comprehensive and up-to-date overviews of knowledge, applications and research activities in a range of topics that are of current interest in the practice of engineering acoustics and vibration technology. The thirteen chapters are grouped into four parts: signal processing, acoustic modelling, environmental and industrial acoustics, and vibration. Following on from its companion volume Fundamentals of Noise and Vibration this book is based partly on material covered in a selection of elective modules in the second semester of the Masters programme in 'Sound and Vibration Studies' of the Institute of Sound and Vibration Research at the University of Southampton, UK and partly on material presented in the annual ISVR short course 'Advanced Course in Acoustics,

Noise and Vibration'.

MECHANICAL VIBRATIONS: THEORY AND APPLICATIONS takes an applications-based approach at teaching students to apply previously learned engineering principles while laying a foundation for engineering design. This text provides a brief review of the principles of dynamics so that terminology and notation are consistent and applies these principles to derive mathematical models of dynamic mechanical systems. The methods of application of these principles are consistent with popular Dynamics texts. Numerous pedagogical features have been included in the text in order to aid the student with comprehension and retention. These include the development of three benchmark problems which are revisited in each chapter, creating a coherent chain linking all chapters in the book. Also included are learning outcomes, summaries of key concepts including important equations and formulae, fully solved examples with an emphasis on real world examples, as well as an extensive exercise set including objective-type

questions. Important Notice: Media content referenced within the product description or the product text may not be available in the ebook version.

Dynamics and Control of StructuresJohn Wiley & Sons

Mechanical Vibrations: Theory and Applications, SI Edition

Trends and Development

Fundamentals of Vibrations

Abstracts

Turbomachinery Rotordynamics

Exploiting Nonlinear Behavior in Structural Dynamics

Engineers are becoming increasingly aware of the problems caused by vibration in engineering design, particularly in the areas of structural health monitoring and smart structures. Vibration is a constant problem as it can impair performance and lead to fatigue, damage and the failure of a structure. Control of vibration is a key factor in preventing such detrimental results. This book presents a homogenous treatment of vibration by including those factors from control that are relevant to modern vibration analysis, design and measurement. Vibration and control are established on a firm mathematical basis and the disciplines of vibration, control, linear algebra, matrix computations, and applied functional analysis are connected. Key Features: Assimilates the discipline of

contemporary structural vibration with active control Introduces the use of Matlab into the solution of vibration and vibration control problems Provides a unique blend of practical and theoretical developments Contains examples and problems along with a solutions manual and power point presentations Vibration with Control is an essential text for practitioners, researchers, and graduate students as it can be used as a reference text for its complex chapters and topics, or in a tutorial setting for those improving their knowledge of vibration and learning about control for the first time. Whether or not you are familiar with vibration and control, this book is an excellent introduction to this emerging and increasingly important engineering discipline.

An integrated presentation of dynamics, vibrations, and control theory, emphasizing the fundamentals of dynamics. The text's flexible structure makes it useful for integrated courses covering all three areas, individual courses in dynamics, and as a quick refresher for professionals. Includes examples, problems and applications.

This book, first published in 1978, examines the confrontation of the Jewish community of Palestine – the Yishuv – with its Arab question in the period immediately following World War 1, a period of excitement and uncertainty. Its main focus is on the different ways in which the men and women of the Yishuv perceived and defined the question of relations with the Arabs, and how they proposed to deal with the problems that arose.

Introductory material.- Approximate methods for analyzing nonlinear structures.-

Vibration isolation.- Designing nonlinear torsional vibration absorbers.- Vibrations of beams in the elasto-plastic and geometrically nonlinear regime.- Control and exploitation of nonlinearity in smart structures. The articles in this volume give an overview and introduction to nonlinear phenomena in structural dynamics. Topics treated are approximate methods for analyzing nonlinear systems (where the level of nonlinearity is assumed to be relatively small), vibration isolation, the mitigation of undesirable torsional vibration in rotating systems utilizing specifically nonlinear features in the dynamics, the vibration of nonlinear structures in which the motion is sufficiently large amplitude and structural systems with control.

Multifrequency Electron Paramagnetic Resonance

A Publication of the Shock and Vibration Information Center, Naval Research Laboratory

Vibration of Continuous Systems

Dynamics of Structures: Second Edition

Forging the Zionist Settler Past

Dynamics and Control of Structures

This book presents the most recent research advances in robot manipulators. It offers a complete survey to the kinematic and dynamic modelling, simulation, computer vision, software engineering, optimization and design of control algorithms applied for robotic systems. It is devoted for a large scale of applications, such as manufacturing,

manipulation, medicine and automation. Several control methods are included such as optimal, adaptive, robust, force, fuzzy and neural network control strategies. The trajectory planning is discussed in details for point-to-point and path motions control. The results in obtained in this book are expected to be of great interest for researchers, engineers, scientists and students, in engineering studies and industrial sectors related to robot modelling, design, control, and application. The book also details theoretical, mathematical and practical requirements for mathematicians and control engineers. It surveys recent techniques in modelling, computer simulation and implementation of advanced and intelligent controllers.

A text/reference on analysis of structures that deform in use. Presents a new, integrated approach to analytical dynamics, structural dynamics and control theory and goes beyond classical dynamics of rigid bodies to incorporate analysis of flexibility of structures. Includes real-world examples of applications such as robotics, precision machinery and aircraft structures.

Fundamentals of Vibrations provides a comprehensive coverage of mechanical vibrations theory and applications. Suitable as a textbook for courses ranging from introductory to graduate level, it can also serve as a reference for practicing engineers. Written by a leading authority in the field, this volume features a clear and precise presentation of the material and is supported by an abundance of physical explanations, many worked-out examples, and numerous homework problems. The

modern approach to vibrations emphasizes analytical and computational solutions that are enhanced by the use of MATLAB. The text covers single-degree-of-freedom systems, two-degree-of-freedom systems, elements of analytical dynamics, multi-degree-of-freedom systems, exact methods for distributed-parameter systems, approximate methods for distributed-parameter systems, including the finite element method, nonlinear oscillations, and random vibrations. Three appendices provide pertinent material from Fourier series, Laplace transformation, and linear algebra.
This book reports on solved problems concerning vibrations and stability of complex beam systems. The complexity of a system is considered from two points of view: the complexity originating from the nature of the structure, in the case of two or more elastically connected beams; and the complexity derived from the dynamic behavior of the system, in the case of a damaged single beam, resulting from the harm done to its simple structure. Furthermore, the book describes the analytical derivation of equations of two or more elastically connected beams, using four different theories (Euler, Rayleigh, Timoshenko and Reddy-Bickford). It also reports on a new, improved p-version of the finite element method for geometrically nonlinear vibrations. The new method provides more accurate approximations of solutions, while also allowing us to analyze geometrically nonlinear vibrations. The book describes the appearance of longitudinal vibrations of damaged clamped-clamped beams as a result of discontinuity (damage). It describes the cases of stability in detail, employing all four theories, and

provides the readers with practical examples of stochastic stability. Overall, the book succeeds in collecting in one place theoretical analyses, mathematical modeling and validation approaches based on various methods, thus providing the readers with a comprehensive toolkit for performing vibration analysis on complex beam systems.
Control and Dynamic Systems V32: Advances in Aerospace Systems Dynamics and Control Systems Part 2 of 3
Vibrations and Stability of Complex Beam Systems
Principles and Techniques of Vibrations
Computer Techniques in Vibration
Computational Methods in Structural Dynamics
Mechanical Vibrations: Theory and Applications
The Oldest Guard tells the story of Zionist settler memory in and around the private Jewish agricultural colonies (moshavot) established in late nineteenth-century Ottoman Palestine. Though they grew into the backbone of lucrative citrus and wine industries of mandate Palestine and Israel, absorbed tens of thousands of Jewish immigrants, and became known as the "first wave" (First Aliyah) of Zionist settlement, these communities have been regarded—and disregarded—in the history of Zionism as sites of conservatism, lack of ideology, and resistance to Labor Zionist politics. Treating the "First Aliyah" as a symbol created and deployed

only in retrospect, Liora R. Halperin offers a richly textured portrait of commemorative practices between the 1920s and the 1960s. Drawing connections to memory practices in other settler societies, The Oldest Guard demonstrates how private agriculturalists and their advocates in the Zionist center and on the right celebrated and forged the "First Aliyah" past, revealing the centrality of settlement to Zionist collective memory and the politics of Zionist settler "firstness."

Encompassing formalism and structure in analytical dynamics, this graduate-level text discusses fundamentals of Newtonian and analytical mechanics, rigid body dynamics, problems in celestial mechanics and spacecraft dynamics, more. 1970 edition.

This book is concerned with electrostructural systems, particularly the interaction between the control of the structural and electrical (electronic) components. Structronics is a new emerging area with many potential applications in the design of high-performance structures, adaptive structures, high-precision systems, and micro-systems. As structures are increasingly being controlled by electronics, the problems of structural engineering can be separated less and less from those of electronic engineering and control engineering. This graduate-level book fills a gap in the literature by considering these problems while giving an overview of the current state of analysis, modelling and control for structronic systems. It is a

coherent compendium written by leading experts in this new research area and gives readers a sophisticated toolbox that will allow them to tackle the modelling and control of smart structures. The inclusion of an extensive, up-to-date bibliography and index makes this volume an invaluable standard for professional reference. Because of the large number of contributions to the present volume, it has been subdivided into two parts, of which this is Part I. This book will be of interest to engineers, materials scientists, physicists and applied mathematicians. The synergistic integration of active (smart) materials, structures, sensors, actuators, and control electronics has redefined the concept of structures from a conventional passive elastic system to an active (life-like) structronic (structure + electronic) system with inherent self-sensing, diagnosis, and control capabilities. Because of its multi-disciplinary nature, the development of structronic systems has attracted researchers and scientists from many disciplines, such as structures, materials, control, electronics, mathematics, manufacturing, electromechanics, and mechanics. In practical applications, this new structronic system can be used as a component of high-performance machines or structural systems, or be an integrated structure itself performing designated function(s). Most common active (smart) materials, such as piezoelectrics, shape-memory alloys, electro- and magneto-strictive materials, and polyelectrolyte gels have been reviewed in Part I.

Application examples are also provided and research issues reported on. While the first part focuses primarily on materials and structures, Part II emphasizes control applications and intelligent systems. With the information provided in this two-volume book, scientists and researchers can easily grasp the state of the art of smart materials and structronic systems, and are ready to pursue their own research and development endeavors. Contents:Part I: Materials and StructuresThe Piezoelectric Vibration Absorber Systems (J Holkamp & T Starchville, Jr.)Self-Sensing Control Applied to Smart Material Systems (E Garcia & L D Jones)An Introduction to Active Constrained Layer Damping Treatments (S Shen)Static and Dynamic Behavior of Adaptive Wings Carrying Externally Mounted Stores (L Librescu & O Song)Adaptive Design and Active Composite Material Systems (J Tani & J-H Qiu)Microelectromechanics and Functionality of Segmented Cylindrical Transducers (H-S Tzou et al.)Thermomechanical Modeling of Shape Memory Alloys and Composites (D Lagoudas et al.)Active-Passive Hybrid Structural Vibration Controls Via Piezoelectrical Networks (K-W Wang & S Kahn)On-Line Structural Damage Detection (H Shen)On Material Degradation and Failure of Piezoelectric Ceramics (H Sosa)Part II: Systems and ControlNear-Minimum-Time Slewing and Vibration Control of Smart Structures(Y Kim et al.)Active Polyelectrolyte Gels as Electrically Controllable Artificial Muscles and

Intelligent Network Structures(M Shahinpoor)Active Dynamic Absorbers — Theory and Application(S Tewani et al.)Active Vibration Sink for Flexible Structures(C-S Chou)Distributed Modal-Space Control and Estimation with Electroelastic Applications(H Öz)Markov Parameters in System Identification: Old and New Concepts(M Q Phan et al.)Effect of System Non-Linearities on the Modified Model Reference Adaptive Control Scheme(H M Sardar & M Ahmadian)Extending Teach-Repeat to Nonholonomic Robots(S B Skaar & J-D Yoder)Dynamic Analysis and Active Vibration Control of Chain Drive Systems(C-A Tan et al.)Basic Concepts of Fault-Tolerant Computing Design(C Aktouf et al.) Readership: Applied mathematicians, applied physicists and mechanical engineers.
Keywords:Structronic Systems;Smart Structures;Devices;Systems;Materials;ControlReviews: "... Professors Guran and Tzou coined the word Structronics in the early 1990s as a new discipline describing the synergetic integration of active materials, structures, sensors, actuators, and control electronics. The present two-volume set is the first comprehensive book ever published on this newly emerging area of engineering. I believe anyone who would like to know what modern science and technology can offer for the design of better structures can learn a great deal from this book. Students and educators can use it as supplemental reading in an intermediate or advanced course on

Structronics, or to gain a broader knowledge of systems thinking, model materials, and structural systems. Practicing engineers wishing to consolidate their knowledge in smart technology will also find this book an invaluable reference." Dr Bernd Schaefer Director Institute of Robotics and Mechatronics, Wessling, Germany

Stability of NonLinear Shells is a compilation of the author's work on analyzing the behaviour of spherical caps and related shell structures under various (axisymmetric) load systems. Differing from other texts on shells of revolution, it is one of the first attempts to deal with effects of multi-parameter load systems. This extension leads to the discovery of some new, hitherto unknown phenomena exhibited by these structures. In addition, the book presents a novel way to characterize properties of solutions of the governing equations for spherical caps - a classification anchored in a theory called reciprocal systems. The author has introduced a deformation map, a projection of multi-dimensional solutions to two-dimensional graphs, to enable analysts to gain insight into the physical meaning of the results obtained. Numerous examples illustrate the concepts introduced. This book also comes to grips with many misconceptions existing in engineering literature about the question of the stability of solutions.

Structural dynamics

The Shock and Vibration Digest
A Collection of Technical Papers
Mechanical Vibration
Vibration and Shock Handbook
Advances in Theory and Applications

This major textbook provides comprehensive coverage of the analytical tools required to determine the dynamic response of structures. The topics covered include: formulation of the equations of motion for single- as well as multi-degree-of-freedom discrete systems using the principles of both vector mechanics and analytical mechanics; free vibration response; determination of frequencies and mode shapes; forced vibration response to harmonic and general forcing functions; dynamic analysis of continuous systems;and wave propagation analysis. The key assets of the book include comprehensive coverage of both the traditional and state-of-the-art numerical techniques of response analysis, such as the analysis by numerical integration of the equations of motion and analysis through frequency domain. The large number of illustrative examples and exercise problems are of great assistance in improving clarity

and enhancing reader comprehension. The text aims to benefit students and engineers in the civil, mechanical and aerospace sectors.

Imparts the theory and analysis regarding the dynamics of rotating machinery in order to design such rotating devices as turbines, jet engines, pumps and power-transmission shafts. Takes into account the forces acting upon machine structures, bearings and related components. Provides numerical techniques for analyzing and understanding rotor systems with examples of actual designs. Features an excellent treatment of numerical methods available to obtain computer solutions for authentic design problems.

Mechanical Vibrations: Theory and Applications takes an applications-based approach at teaching students to apply previously learned engineering principles while laying a foundation for engineering design. This text provides a brief review of the principles of dynamics so that terminology and notation are consistent and applies these principles to derive mathematical models of dynamic mechanical systems. The methods of application of these principles are consistent with popular

Dynamics texts. Numerous pedagogical features have been included in the text in order to aid the student with comprehension and retention. These include the development of three benchmark problems which are revisited in each chapter, creating a coherent chain linking all chapters in the book. Also included are learning outcomes, summaries of key concepts including important equations and formulae, fully solved examples with an emphasis on real world examples, as well as an extensive exercise set including objective-type questions. Important Notice: Media content referenced within the product description or the product text may not be available in the ebook version.
Filling the gap for a systematic, authoritative, and up-to-date review of this cutting-edge technique, this book covers both low and high frequency EPR, emphasizing the importance of adopting the multifrequency approach to study paramagnetic systems in full detail by using the EPR method. In so doing, it discusses not only the underlying theory and applications, but also all recent advances -- with a final section devoted to future perspectives.
AIAA Guidance and Control Conference, August 19-21, 1981,

Albuquerque, New Mexico
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Analysis, Uncertainties, and Control, Third Edition