

An Analytical Approach To Solving Motor Vibration Problems

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Road and Off-Road Vehicle System Dynamics Handbook - Gianpiero Mastinu 2014-01-06

Featuring contributions from leading experts, the Road and Off-Road Vehicle System Dynamics Handbook provides comprehensive, authoritative coverage of all the major issues involved in road vehicle dynamic behavior. While the focus is on automobiles, this book also highlights motorcycles, heavy commercial vehicles, and off-road vehicles. The authors

Integrated Vehicle Health Management - Timothy Wilmering 2017-07-24

Integrated Vehicle Health Management (IVHM) is the unified capability of a system of systems (SoS) to assess the current or future state of the member system health, and integrate it within a framework of available resources and operational demand. As systems complexities have increased, so have system support costs, driven by more frequent and often enigmatic subsystem failures. IVHM strategies can be used to mitigate these issues by taking a Systems of Systems view. Combined with advanced decision support methods, this approach can be used to more effectively predict, isolate, schedule, and repair failed subsystems, reducing platform support costs and minimizing platform down time. Integrated Vehicle Health Management- System of Systems Integration brings together ten seminal SAE technical papers addressing the challenges and solutions to maintaining highly complex vehicles. The strategy requires that the IVHM system must provide actionable decision support to operators and maintainers, informing platform operational capabilities and maintenance procedures. The goal is to prevent a given component from degrading to the point of failure or predictable impending failure. Specifications should also reflect a common means for communicating this information to other health- ready IVHM system components.

Vibration Engineering and Technology of Machinery - José Manoel Balthazar 2021-03-03

This volume gathers the latest advances, innovations and applications in the field of vibration and technology of machinery, as presented by leading international researchers and engineers at the XV International Conference on Vibration Engineering and Technology of Machinery (VETOMAC), held in Curitiba, Brazil on November 10-15, 2019. Topics include concepts and methods in dynamics, dynamics of mechanical and structural systems, dynamics and control, condition monitoring, machinery and structural dynamics, rotor dynamics, experimental techniques, finite element model updating, industrial case studies, vibration control and energy harvesting, and MEMS. The contributions, which were selected through a rigorous international peer-review process, share exciting ideas that will spur novel research directions and foster new multidisciplinary collaborations.

Nonlinear Vibrations Excited by Limited Power Sources - José Manoel Balthazar 2022

The book covers a wide range of applied engineering research compactly presented in one volume, and shows innovative practical engineering solutions for automotive, marine and aviation industries, as well as power generation related to nonlinear vibrations excited by limited power sources. While targeting primarily the audience of professional scientists and engineers, the book can also be useful for graduate students, and for all of those who are relatively new to the area and are looking for a single source with a good overview of the state-of-the-art as well as up-to-date information on theories, analytical, numerical methods, and their applications in design, simulations, testing, and manufacturing. The readers will find here a rich mixture of approaches, software tools and case studies used to investigate and optimize diverse

powertrains, their functional units and separate machine parts based on different physical phenomena, their mathematical model representations, solution algorithms, and experimental validation.

Dynamical Systems in Applications - Jan Awrejcewicz 2018-09-01

The book is intended for all those who are interested in application problems related to dynamical systems. It provides an overview of recent findings on dynamical systems in the broadest sense. Divided into 46 contributed chapters, it addresses a diverse range of problems. The issues discussed include: Finite Element Analysis of optomechatronic choppers with rotational shafts; computational based constrained dynamics generation for a model of a crane with compliant support; model of a kinetic energy recuperation system for city buses; energy accumulation in mechanical resonance; hysteretic properties of shell dampers; modeling a water hammer with quasi-steady and unsteady friction in viscoelastic conduits; application of time-frequency methods for the assessment of gas metal arc welding conditions; non-linear modeling of the human body's dynamic load; experimental evaluation of mathematical and artificial neural network modeling for energy storage systems; interaction of bridge cables and wake in vortex-induced vibrations; and the Sommerfeld effect in a single DOF spring-mass-damper system with non-ideal excitation.

Proceedings of ... International Conference on Power Electronics and Drive Systems - 2005

Proceedings of the FISITA 2012 World Automotive Congress - SAE-China 2012-11-14

Proceedings of the FISITA 2012 World Automotive Congress are selected from nearly 2,000 papers submitted to the 34th FISITA World Automotive Congress, which is held by Society of Automotive Engineers of China (SAE-China) and the International Federation of Automotive Engineering Societies (FISITA). This proceedings focus on solutions for sustainable mobility in all areas of passenger car, truck and bus transportation. Volume 7: Vehicle Design and Testing (I) focuses on:
• Vehicle Performance Development
• Vehicle Integration Platformized and Universal Design
• Development of CAD /CAE/CAM and CF Methods in Automotive Practice
• Advanced Chassis, Body Structure and Design
• Automotive Ergonomic, Interior and Exterior Trim Design
• Vehicle Style and Aerodynamic Design
• New Materials and Structures
Above all researchers, professional engineers and graduates in fields of automotive engineering, mechanical engineering and electronic engineering will benefit from this book. SAE-China is a national academic organization composed of enterprises and professionals who focus on research, design and education in the fields of automotive and related industries. FISITA is the umbrella organization for the national automotive societies in 37 countries around the world. It was founded in Paris in 1948 with the purpose of bringing engineers from around the world together in a spirit of cooperation to share ideas and advance the technological development of the automobile.

SV. Sound and Vibration - 2003

Rotating Machinery, Vibro-Acoustics & Laser Vibrometry, Volume 7 - Dario Di Maio 2018-06-04

Rotating Machinery, Vibro-Acoustics & Laser Vibrometry, Volume 7: Proceedings of the 36th IMAC, A Conference and Exposition on Structural Dynamics, 2018, the seventh volume of nine from the Conference brings together contributions to this important area of research and engineering. The collection presents early findings and case studies on fundamental and applied aspects of Rotating Machinery,

Hybrid Testing, Vibro-Acoustics & Laser Vibrometry, including papers on: Rotating Machinery Vibro-Acoustics Experimental Techniques Scanning Laser Doppler Vibrometry Methods
The Shock and Vibration Bulletin - 1978

Applied Mechanics Reviews - 1970

Vibration Monitoring of Induction Motors - William T. Thomson
2020-11-30

Master the art of vibration monitoring of induction motors with this unique guide to on-line condition assessment and fault diagnosis, building on the author's fifty years of investigative expertise. It includes:
*Robust techniques for diagnosing of a wide range of common faults, including shaft misalignment and/or soft foot, rolling element bearing faults, sleeve bearing faults, magnetic and vibrational issues, resonance in vertical motor drives, and vibration and acoustic noise from inverters.
*Detailed technical coverage of thirty real-world industrial case studies, from initial vibration spectrum analysis through to fault diagnosis and final strip-down.
*An introduction to real-world vibration spectrum analysis for fault diagnosis, and practical guidelines to reduce bearing failure through effective grease management. This definitive book is essential reading for industrial end-users, engineers, and technicians working in motor design, manufacturing, and condition monitoring. It will also be of interest to researchers and graduate students working on condition monitoring.

The Shock and Vibration Digest - 1984

Large Space Structures & Systems in the Space Station Era - 1991

Designing Sound - Andy Farnell 2010-08-20

A practitioner's guide to the basic principles of creating sound effects using easily accessed free software. *Designing Sound* teaches students and professional sound designers to understand and create sound effects starting from nothing. Its thesis is that any sound can be generated from first principles, guided by analysis and synthesis. The text takes a practitioner's perspective, exploring the basic principles of making ordinary, everyday sounds using an easily accessed free software. Readers use the Pure Data (Pd) language to construct sound objects, which are more flexible and useful than recordings. Sound is considered as a process, rather than as data—an approach sometimes known as “procedural audio.” Procedural sound is a living sound effect that can run as computer code and be changed in real time according to unpredictable events. Applications include video games, film, animation, and media in which sound is part of an interactive process. The book takes a practical, systematic approach to the subject, teaching by example and providing background information that offers a firm theoretical context for its pragmatic stance. [Many of the examples follow a pattern, beginning with a discussion of the nature and physics of a sound, proceeding through the development of models and the implementation of examples, to the final step of producing a Pure Data program for the desired sound. Different synthesis methods are discussed, analyzed, and refined throughout.] After mastering the techniques presented in *Designing Sound*, students will be able to build their own sound objects for use in interactive applications and other projects

Intelligent Transportation Systems (ITS) - Beatriz L. Boada
2021-04-22

This book presents collective works published in the recent Special Issue (SI) entitled " Intelligent Transportation Systems (ITS)". These works address problems of mobility, environmental pollution, and road safety, as well as their related applications. The presented problems are complex and involve a large number of research areas and many advanced technologies, such as communication, sensing, and control, which are used for managing a large amount of information. The applications vary and include fleet management, driving behavior, traffic control, trajectory planning, connected vehicles, and energy consumption efficiency. Recent advances in communication technologies are becoming fundamental for the development of new advances in fleet management, traffic control, and connected vehicles. This works collected in this Special Issue propose solution methodologies to address such challenges, analyze the proposed methodologies, and evaluate their performance. This book brings together a collection of multidisciplinary works applied to ITS applications in a coherent manner.

4th International R&D Conference, Water and Energy for 21st Century, 28-31 January 2003, Aurangabad, Maharashtra: Energy -

2003

Chiefly with reference to India.

Nonlinear Dynamical Systems in Engineering - Vasile Marinca
2012-01-05

This book presents and extend different known methods to solve different types of strong nonlinearities encountered by engineering systems. A better knowledge of the classical methods presented in the first part lead to a better choice of the so-called “base functions”. These are absolutely necessary to obtain the auxiliary functions involved in the optimal approaches which are presented in the second part. Every chapter introduces a distinct approximate method applicable to nonlinear dynamical systems. Each approximate analytical approach is accompanied by representative examples related to nonlinear dynamical systems from to various fields of engineering.

Mechatronics 2017 - Tomáš Březina 2017-08-16

This book presents nearly 90 carefully selected contributions at the 12th International Conference Mechatronics, which took place in Brno, Czech Republic on 6–8 September 2017. Reflecting the most progressive and constantly changing areas of mechatronics, these proceedings includes papers concerning modeling and simulation, automatic control, robotics, sensors and actuators, electrical machines, and energy harvesting. It not only offers inspiration, but also deepens readers’ interdisciplinary and integrated understanding of modern engineering. The book is intended for experts in the integration of electronic, mechanical, control and computer sciences.

Vibration Control and Actuation of Large-Scale Systems - Hamid Reza Karimi 2020-05-20

Vibration Control and Actuation of Large-Scale Systems gives a systematically and self-contained description of the many facets of envisaging, designing, implementing, or experimentally exploring advanced vibration control systems. The book is devoted to the development of mathematical methodologies for vibration analysis and control problems of large-scale systems, including structural dynamics, vehicle dynamics and wind turbines, for example. The research problems addressed in each chapter are well motivated, with numerical and simulation results given in each chapter that reflect best engineering practice. Provides a series of the latest results in vibration control, structural control, actuation, component failures, and more Gives numerical and simulation results to reflect best engineering practice Presents recent advances of theory, technological aspects, and applications of advanced control methodologies in vibration control
Rotating Machinery Vibration - Maurice L. Adams 2010-08-09
Diagnosis and correction are critical tasks for the vibrations engineer. Many causes of rotor vibration are so subtle and pervasive that excessive vibration continues to occur despite the use of usually effective design practices and methods of avoidance. *Rotating Machinery Vibration: From Analysis to Troubleshooting* provides a comprehensive, consolidated overview of the fundamentals of rotating machinery vibration and addresses computer model building, sources and types of vibration, and machine vibration signal analysis. This reference is a powerful tool to strengthen vital in-house competency on the subject for professionals in a variety of fields. After presenting governing fundamental principles and background on modern measurement, computational tools, and troubleshooting methods, the author provides practical instruction and demonstration on how to diagnose vibration problems and formulate solutions. The topic is covered in four sequential sections: Primer on Rotor Vibration, Use of Rotor Dynamic Analyses, Monitoring and Diagnostics, and Troubleshooting Case Studies. This book includes comprehensive descriptions of vibration symptoms for rotor unbalance, dynamic instability, rotor-stator rubs, misalignment, loose parts, cracked shafts, and rub-induced thermal bows. It is an essential reference for mechanical, chemical, design, manufacturing, materials, aerospace, and reliability engineers. Particularly useful as a reference for specialists in vibration, rotating machinery, and turbomachinery, it also makes an ideal text for upper-level undergraduate and graduate students in these disciplines.

Condition Monitoring and Faults Diagnosis of Induction Motors - Nordin Saad 2018-07-11

The book covers various issues related to machinery condition monitoring, signal processing and conditioning, instrumentation and measurements, faults for induction motors failures, new trends in condition monitoring, and the fault identification process using motor currents electrical signature analysis. It aims to present a new non-invasive and non-intrusive condition monitoring system, which has the capability to detect various defects in induction motor at incipient stages

within an arbitrary noise conditions. The performance of the developed system has been analyzed theoretically and experimentally under various loading conditions of the motor. Covers current and new approaches applied to fault diagnosis and condition monitoring. Integrates concepts and practical implementation of electrical signature analysis. Utilizes LabVIEW tool for condition monitoring problems. Incorporates real-world case studies. Paves way a technology potentially for prescriptive maintenance via IIoT.

Conference Record of 2000 Annual Pulp and Paper Industry Technical Conference - Institute of Electrical and Electronics Engineers 2000

Energy Efficiency in Motor Systems - Paolo Bertoldi 2021-09-24

This book contains selected, peer-reviewed papers presented at the 11th International Conference on Energy Efficiency in Motor Systems (EEMODS'19), held in Tokyo, Japan from 17-19 September 2019. As with previous conferences in this series, EEMODS'19 provided a scientific forum to discuss and debate the latest developments and impacts of electrical motor systems on energy and the environment, energy efficiency policies and programmes adopted and planned, standards (including ISO 50.001), and the technical and commercial advances made in the dissemination and penetration of energy-efficient motor systems. Topics covered include: technologies, research and innovation in the areas of electric motors from life cycle costing to 3D printing to artificial intelligence/machine learning-based monitoring systems; emerging motor technologies; power electronics and drives; pump systems, including life cycle costing, energy efficiency improvements, maintenance, and operation for industrial, water supply and treatment, building, and irrigation; compressed air systems; fans /exhaust systems; refrigeration systems maintenance and operation; mechanical power transmission; motors in household appliances and HVAC (residential and commercial); motors and drives for transport applications including policies, programmes, regulation, and international standards; industrial management policies and standards; motor system audit and verification; policies, programmes and financing: analysis of motor system energy use and greenhouse gas emissions for motor systems, e-vehicles and related charging infrastructure; harmonization of global motor efficiency test standards; evaluation of utility programmes for improving energy efficiency in motor systems; and policy implementation, market surveillance and enforcement mechanisms, including case studies. The conference is international by nature and aims to attract high quality and innovative contributions from all corners of the globe, while the papers facilitate the development of new technologies, policies and strategies to increase energy efficiency.

Mechanical Design and Manufacturing of Electric Motors - Wei Tong 2022-05-20

This Second Edition of Mechanical Design and Manufacturing of Electric Motors provides in-depth knowledge of design methods and developments of electric motors in the context of rapid increases in energy consumption, and emphasis on environmental protection, alongside new technology in 3D printing, robots, nanotechnology, and digital techniques, and the challenges these pose to the motor industry. From motor classification and design of motor components to model setup and material and bearing selections, this comprehensive text covers the fundamentals of practical design and design-related issues, modeling and simulation, engineering analysis, manufacturing processes, testing procedures, and performance characteristics of electric motors today. This Second Edition adds three brand new chapters on motor breaks, motor sensors, and power transmission and gearing systems. Using a practical approach, with a focus on innovative design and applications, the book contains a thorough discussion of major components and subsystems, such as rotors, shafts, stators, and frames, alongside various cooling techniques, including natural and forced air, direct- and indirect-liquid, phase change, and other newly-emerged innovative cooling methods. It also analyzes the calculation of motor power losses, motor vibration, and acoustic noise issues, and presents engineering analysis methods and case-study results. While suitable for motor engineers, designers, manufacturers, and end users, the book will also be of interest to maintenance personnel, undergraduate and graduate students, and academic researchers.

JSME International Journal - 2006

Noise, Vibration and Harshness of Electric and Hybrid Vehicles - Lijun Zhang 2020-12-29

The noise, vibration, and harshness (NVH), also known as noise and

vibration (N&V), is a critical feature for customers to assess the performance and quality of vehicles. NVH characteristics are higher among factors that customers use to judge the vehicle's quality. This book sets out to introduce the basic concepts, principles, and applications of the NVH development and refinement of Battery Electric Vehicles (BEV), Hybrid Electric Vehicles (HEV), and Fuel Cell Electric Vehicles. Each type comes with its own set of challenges.

Vibration Monitoring of Induction Motors - William T. Thomson 2020-12-03

Master the art of vibration monitoring of induction motors with this unique guide to on-line condition assessment and fault diagnosis, building on the author's fifty years of investigative expertise. It includes: *Robust techniques for diagnosing of a wide range of common faults, including shaft misalignment and/or soft foot, rolling element bearing faults, sleeve bearing faults, magnetic and vibrational issues, resonance in vertical motor drives, and vibration and acoustic noise from inverters. *Detailed technical coverage of thirty real-world industrial case studies, from initial vibration spectrum analysis through to fault diagnosis and final strip-down. *An introduction to real-world vibration spectrum analysis for fault diagnosis, and practical guidelines to reduce bearing failure through effective grease management. This definitive book is essential reading for industrial end-users, engineers, and technicians working in motor design, manufacturing, and condition monitoring. It will also be of interest to researchers and graduate students working on condition monitoring.

International Symposium on Fluid Machinery Troubleshooting - American Society of Mechanical Engineers. Winter Meeting 1986

Machinery Failure Analysis and Troubleshooting - Heinz P. Bloch 2012-12-10

Solve the machinery failure problems costing you time and money with this classic, comprehensive guide to analysis and troubleshooting Provides detailed, complete and accurate information on anticipating risk of component failure and avoiding equipment downtime Includes numerous photographs of failed parts to ensure you are familiar with the visual evidence you need to recognize Covers proven approaches to failure definition and offers failure identification and analysis methods that can be applied to virtually all problem situations Demonstrates with examples how the progress and results of failure analysis and troubleshooting efforts can be documented and monitored Failures of machinery in a plant setting can have wide-ranging consequences and in order to stay competitive, corporations across all industries must optimize the efficiency and reliability of their machinery. Machinery Failure Analysis and Troubleshooting is a trusted, established reference in the field, authored by two well-known authorities on failure and reliability. Structured to teach failure identification and analysis methods that can be applied to almost all problem situations, this eagerly awaited update takes in the wealth of technological advances and changes in approach seen since the last edition published more than a decade ago. Covering both the engineering detail and management theory, Machinery Failure Analysis and Troubleshooting provides a robust go-to reference and training resource for all engineers and managers working in manufacturing and process plants. Provides detailed, complete and accurate information on anticipating risk of component failure and avoiding equipment downtime Presents documented failure case studies and analyzes the procedures employed to define events that led to component or systems failure Includes numerous photographs of failed parts to ensure readers are familiar with the visual evidence they need to recognize

Smart Wireless Acoustic Sensor Network Design for Noise Monitoring in Smart Cities - Rosa Ma Alsina-Pagès 2021-01-15

The Environmental Noise Directive (END) requires that a five-year updating of noise maps is carried out to check and report on the changes that have occurred during the reference period. The updating process is usually achieved using a standardized approach consisting of collecting and processing information through acoustic models to produce the updated noise maps. This procedure is time consuming and costly, and has a significant impact on the financial statement of the authorities responsible for providing the maps. Furthermore, the END requires that easy-to-read noise maps are made available to the public to provide information on noise levels and the subsequent actions to be undertaken by local and central authorities to reduce noise impacts. In order to update the noise maps more easily and in a more effective way, it is convenient to design an integrated system incorporating real-time noise measurement and signal processing to identify and analyze the noise

sources present in the mapping area (e.g., road traffic noise, leisure noise, etc.) as well as to automatically generate and present the corresponding noise maps. This wireless acoustic sensor network design requires transversal knowledge, from accurate hardware design for acoustic sensors to network structure design and management of the information with signal processing to identify the origin of the measured noise and graphical user interface application design to present the results to end users. This book is collection in which several views of methodology and technologies required for the development of an efficient wireless acoustic sensor network from the first stages of its design to the tests conducted during deployment, its final performance, and possible subsequent implications for authorities in terms of the definition of policies. Contributions include several LIFE and H2020 projects aimed at the design and implementation of intelligent acoustic sensor networks with a focus on the publication of good practices for the design and deployment of intelligent networks in other locations. Advances in Materials, Mechanics and Manufacturing II - Mounir Ben Amar 2021-09-20

This book reports on innovative materials research with a special emphasis on methods, modeling, and simulation tools for analyzing material behavior, emerging materials, and composites, and their applications in the field of manufacturing. Chapters are based on contributions to the third International Conference on Advanced Materials Mechanics and Manufacturing, A3M2021, organized by the Laboratory of Mechanics, Modeling, and Manufacturing (LA2MP) of the National School of Engineers of Sfax, Tunisia and held online on March 25-27, 2021. They cover a variety of topics, spanning from experimental analysis of material plasticity and fatigue, numerical simulation of material behavior, and optimization of manufacturing processes, such as cutting and injection, among others. Offering a good balance of fundamental research and industrially relevant findings, they provide researchers and professionals with a timely snapshot of and extensive information on current developments in the field and a source of inspiration for future research and collaboration.

Noise of Polyphase Electric Motors - Jacek F. Gieras 2018-10-03
Controlling the level of noise in electrical motors is critical to overall system performance. However, predicting noise of an electrical motor is more difficult and less accurate than for other characteristics such as torque-speed. Recent advances have produced powerful computational methods for noise prediction, and *Noise of Polyphase Electric Motors* is the first book to collect these advances in a single source. It is also the first to include noise prediction for permanent magnet (PM) synchronous motors. Complete coverage of all aspects of electromagnetic, structural, and vibro-acoustic noise makes this a uniquely comprehensive reference. The authors begin with the basic principles of noise generation and radiation, magnetic field and radial forces, torque pulsations, acoustic calculations, as well as noise and vibration of mechanical and acoustic origin. Moving to applications, the book examines in detail stator system vibration analysis including the use of finite element method (FEM) modal analysis; FEM for radial pressure and structural modeling; boundary element methods (BEM) for acoustic radiation; statistical energy analysis (SEA); instrumentation including technologies, procedures, and standards; and both passive and active methods for control of noise and vibration. *Noise of Polyphase Electric Motors* gathers the fundamental concepts along with all of the analytical, numerical, and statistical methods into a unified reference. It supplies all of the tools necessary to improve the noise performance of electrical motors at the design stage.

Vibration Problems ICOVP 2011 - Jiří Náprstek 2011-12-14
This volume presents the Proceedings of the 10th International Conference on Vibration Problems, 2011, Prague, Czech Republic. ICOVP 2011 brings together again scientists from different backgrounds who are actively working on vibration-related problems of engineering both in theoretical and applied fields, thus facilitating a lively exchange of ideas, methods and results between the many different research areas. The aim is that reciprocal intellectual fertilization will take place and ensure a broad interdisciplinary research field. The topics, indeed, cover a wide variety of vibration-related subjects, from wave problems in solid mechanics to vibration problems related to biomechanics. The first ICOVP conference was held in 1990 at A.C. College, Jalpaiguri, India, under the co-chairmanship of Professor M.M. Banerjee and Professor P. Biswas. Since then it has been held every 2 years at various venues across the World.

Automotive Software Engineering - Thomas Zurawka 2016-09-18

Since the early seventies, the development of the automobile has been characterized by a steady increase in the deployment of onboard electronics systems and software. This trend continues unabated and is driven by rising end-user demands and increasingly stringent environmental requirements. Today, almost every function onboard the modern vehicle is electronically controlled or monitored. The software-based implementation of vehicle functions provides for unparalleled freedoms of concept and design. However, automobile development calls for the accommodation of contrasting prerequisites - such as higher demands on safety and reliability vs. lower cost ceilings, longer product life cycles vs. shorter development times - along with growing proliferation of model variants. Automotive Software Engineering has established its position at the center of these seemingly conflicting opposites. This book provides background basics as well as numerous suggestions, rare insights, and cases in point concerning those processes, methods, and tools that contribute to the surefooted mastery of the use of electronic systems and software in the contemporary automobile.

Optimal Auxiliary Functions Method for Nonlinear Dynamical Systems - Vasile Marinca 2021-07-14

This book presents the optimal auxiliary functions method and applies it to various engineering problems and in particular in boundary layer problems. The cornerstone of the presented procedure is the concept of "optimal auxiliary functions" which are needed to obtain accurate results in an efficient way. Unlike other known analytic approaches, this procedure provides us with a simple but rigorous way to control and adjust the convergence of the solutions of nonlinear dynamical systems. The optimal auxiliary functions are depending on some convergence-control parameters whose optimal values are rigorously determined from mathematical point of view. The capital strength of our procedure is its fast convergence, since after only one iteration, we obtain very accurate analytical solutions which are very easy to be verified. Moreover, no simplifying hypothesis or assumptions are made. The book contains a large amount of practical models from various fields of engineering such as classical and fluid mechanics, thermodynamics, nonlinear oscillations, electrical machines, and many more. The book is a continuation of our previous books "Nonlinear Dynamical Systems in Engineering. Some Approximate Approaches", Springer-2011 and "The Optimal Homotopy Asymptotic Method. Engineering Applications", Springer-2015.

Case Histories in Vibration Analysis and Metal Fatigue for the Practicing Engineer - Anthony Sofronas 2012-07-25

This highly accessible book provides analytical methods and guidelines for solving vibration problems in industrial plants and demonstrates their practical use through case histories from the author's personal experience in the mechanical engineering industry. It takes a simple, analytical approach to the subject, placing emphasis on practical applicability over theory, and covers both fixed and rotating equipment, as well as pressure vessels. It is an ideal guide for readers with diverse experience, ranging from undergraduate students to mechanics and professional engineers.

Industrial Approaches in Vibration-Based Condition Monitoring - Jyoti Kumar Sinha 2020-01-21

Vibration-based condition monitoring (VCM) is a well-accepted approach in industries for early detection of any defect, thereby triggering the maintenance process and ultimately reducing overheads and plant downtime. A number of vibration instruments, data analyzer and related hardware and software codes are developed to meet the industry requirements. This book aims to address issues faced by VCM professionals, such as frequency range estimation for vibration measurements, sensors, data collection and data analyzer including related parameters which are explained through step-by-step approaches. Each chapter is written in the tutorial style with experimental and/or industrial examples for clear understanding.

Pattern Recognition and Information Processing - Sergey V. Ablameyko 2019-11-22

This book constitutes the refereed proceedings of the 14th International Conference on Pattern Recognition and Information Processing, PRIP 2019, held in Minsk, Belarus, in May 2019. The 25 revised full papers were carefully reviewed and selected from 120 submissions. The papers of this volume are organized in topical sections on pattern recognition and image analysis; information processing and applications.

Conference Record, Industry Applications Society, IEEE-IAS Annual Meeting - IEEE Industry Applications Society. Annual Meeting 2000