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Proceedings of the 9th IFToMM International Conference on Rotor Dynamics
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Proceedings of the 10th International Conference on Rotor Dynamics – IFToMM Rotating Machinery Vibration
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Design and Modeling of Mechanical Systems—III
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Advances in Mechanical Engineering and Mechanics II
This comprehensive reference/text provides a thorough grounding in the fundamentals of rotating machinery vibration-treating computer model building, sources and types of vibration, and machine vibration signal analysis. Illustrating turbomachinery, vibration severity levels, condition monitoring, and rotor vibration cause identification, Rotating Machinery Vibration provides a primer on vibration fundamentals. Highlights calculation of rotor unbalance response and rotor self-excited vibration. Demonstrates calculation of rotor balancing weights. Furnishes PC codes for lateral rotor vibration analyses. Treats bearing, seal, impeller, and blade effects on rotor vibration. Describes modes, excitation, and stability of computer models. Includes extensive PC data coefficient files on bearing dynamics. Providing comprehensive descriptions of vibration symptoms for rotor unbalance, dynamic instability, rotor-stator rubs, misalignment, loose parts, cracked shafts, and rub-induced thermal bows, Rotating Machinery Vibration is an essential reference for mechanical, chemical, design, manufacturing, materials, aerospace, and reliability engineers; and specialists in vibration, rotating machinery, and turbomachinery; and an ideal text for upper-level undergraduate and graduate students in these disciplines.

Proceedings of the 5th International Conference on Industrial Engineering (ICIE 2019)

As the most important parts of rotating machinery, rotors are also the most prone to mechanical vibrations, which may lead to machine failure. Correction is only possible when proper and accurate diagnosis is obtained through understanding of rotor operation and all of the potential malfunctions that may occur. Mathematical modeling, in particular modal modeling, is key to understanding observed phenomena through measured data and for predicting and preventing failure. Rotordynamics advances simple yet adequate models of rotordynamic problems and phenomena related to rotor operation in its environment. Based on Dr. Muszyńska's extensive work at Bently Rotor Dynamics Research Corporation, world renowned for innovative and groundbreaking experiments in the field, this book provides realistic models, step-by-step experimental methods, and the principles of vibration monitoring and practical malfunction diagnostics of rotating machinery. It covers extended rotor models, rotor/fluid-related phenomena, rotor-to-stationary part rubbing, and other related problems such as nonsynchronous perturbation testing. The author also illustrates practical diagnoses of several possible malfunctions and emphasizes correct
interpretation of computer-generated numerical results. Rotordynamics is the preeminent guide to rotordynamic theory and practice. It is the most valuable tool available for anyone working on modeling rotating machinery at the machine design stage or performing further analytical and experimental research on rotating machine dynamics.

**Advances in Italian Mechanism Science**

Since Lord Rayleigh introduced the idea of viscous damping in his classic work "The Theory of Sound" in 1877, it has become standard practice to use this approach in dynamics, covering a wide range of applications from aerospace to civil engineering. However, in the majority of practical cases this approach is adopted more for mathematical convenience than for modeling the physics of vibration damping. Over the past decade, extensive research has been undertaken on more general "non-viscous" damping models and vibration of non-viscously damped systems. This book, along with a related book Structural Dynamic Analysis with Generalized Damping Models: Identification, is the first comprehensive study to cover vibration problems with general non-viscous damping. The author draws on his considerable research experience to produce a text covering: dynamics of viscously damped systems; non-viscously damped single- and multi-degree-of-freedom systems; linear systems with non-local and non-viscous damping; reduced computational methods for damped systems; and finally a method for dealing with general asymmetric systems. The book is written from a vibration theory standpoint, with numerous worked examples which are relevant across a wide range of mechanical, aerospace and structural engineering applications. Contents 1. Introduction to Damping Models and Analysis Methods. 2. Dynamics of Undamped and Viscously Damped Systems. 3. Non-Viscously Damped Single-Degree-of-Freedom Systems. 4. Non-viscously Damped Multiple-Degree-of-Freedom Systems. 5. Linear Systems with General Non-Viscous Damping. 6. Reduced Computational Methods for Damped Systems

**Rotordynamics**

This book opens with an explanation of the vibrations of a single degree-of-freedom (dof) system for all beginners. Subsequently, vibration analysis of multi-dof systems is explained by modal analysis. Mode synthesis modeling is then
introduced for system reduction, which aids understanding in a simplified manner of how complicated rotors behave. Rotor balancing techniques are offered for rigid and flexible rotors through several examples. Consideration of gyroscopic influences on the rotordynamics is then provided and vibration evaluation of a rotor-bearing system is emphasized in terms of forward and backward whirl rotor motions through eigenvalue (natural frequency and damping ratio) analysis. In addition to these rotordynamics concerning rotating shaft vibration measured in a stationary reference frame, blade vibrations are analyzed with Coriolis forces expressed in a rotating reference frame. Other phenomena that may be assessed in stationary and rotating reference frames include stability characteristics due to rotor internal damping and instabilities due to asymmetric shaft stiffness and thermal unbalance behavior.

Vibration and Wear in High Speed Rotating Machinery

Rotating Machinery, Vibro-Acoustics & Laser Vibrometry, Volume 7

Vibration-based Condition Monitoring

Innovative Approaches in Computational Structural Engineering

This volume gathers the latest advances, innovations, and applications in the field of robotics engineering, as presented by leading international researchers and engineers at the Latin American Symposium on Industrial and Robotic Systems (LASIRS), held in Tampico, Mexico on October-November 30-01 2019. The contributions cover all major areas of R&D and innovation in simulation, optimization, and control of robotics, such as design and optimization of robots using numerical and metaheuristic methods, autonomous and control systems, industrial
compliance solutions, numerical simulations for manipulators and robots, metaheuristics applied to robotics problems, Industry 4.0, control and automation in petrochemical processes, simulation and control in aerospace and aeronautics, and education in robotics. The conference represented a unique platform to share the latest research and developments in simulation, control and optimization of robotic systems, and to promote cooperation among specialists in machine and mechanism area.

Industrial and Robotic Systems

IFTToMM conferences have a history of success due to the various advances achieved in the field of rotor dynamics over the past three decades. These meetings have since become a leading global event, bringing together specialists from industry and academia to promote the exchange of knowledge, ideas, and information on the latest developments in the dynamics of rotating machinery. The scope of the conference is broad, including e.g. active components and vibration control, balancing, bearings, condition monitoring, dynamic analysis and stability, wind turbines and generators, electromechanical interactions in rotor dynamics and turbochargers. The proceedings are divided into four volumes. This fourth volume covers the following main topics: aero-engines; turbochargers; eolian (wind) generators; automotive rotating systems; and hydro power plants.

Structural Dynamics of Turbo-Machines

Vibrations of Rotating Machinery

Vibration Problems in Machines: Diagnosis and Resolution explains how to infer information about the internal operations of rotating machines from external measurements. In doing so, the book examines the vibration signals arising under various fault conditions, such as rotor imbalance, misalignment, cracked rotors, gear wear, whirling instabilitie
Special Topics in Structural Dynamics & Experimental Techniques, Volume 5

Nonlinear Dynamics, Volume 1. Proceedings of the 34th IMAC, A Conference and Exposition on Dynamics of Multiphysical Systems: From Active Materials to Vibroacoustics, 2016, the first volume of ten 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 Structural Dynamics, including papers on: • Nonlinear Oscillations • Nonlinear Modal Analysis • Nonlinear System Identification • Nonlinear Modeling & Simulation • Nonlinearity in Practice • Nonlinearity in Multi-Physics Systems • Nonlinear Modes and Modal Interactions

Proceedings of IncoME-V & CEPE Net-2020

Hydrodynamics of Pumps is a reference for pump experts and a textbook for advanced students. It examines the fluid dynamics of liquid turbomachines, particularly pumps, focusing on special problems and design issues associated with the flow of liquid through a rotating machine. There are two characteristics of a liquid that lead to problems and cause a significantly different set of concerns than those in gas turbines. These are the potential for cavitation and the high density of liquids, which enhances the possibility of damaging, unsteady flows and forces. The book begins with an introduction to the subject, including cavitation, unsteady flows and turbomachinery, basic pump design and performance principles. Chapter topics include flow features, cavitation parameters and inception, bubble dynamics, cavitation effects on pump performance, and unsteady flows and vibration in pumps - discussed in the three final chapters. The book is richly illustrated and includes many practical examples.

Structural Dynamic Analysis with Generalized Damping Models

The VETOMAC-X Conference covered a holistic plethora of relevant topics in vibration and engineering technology including condition monitoring, machinery and structural dynamics, rotor dynamics, experimental techniques, finite element model updating, industrial case studies, vibration control and energy harvesting, and signal processing. These
proceedings contain not only all of the nearly one-hundred peer-reviewed presentations from authors representing more than twenty countries, but also include six invited lectures from renowned experts: Professor K. Gupta, Mr W. Hahn, Professor A.W. Lees, Professor John Mottershead, Professor J.S. Rao, and Dr P. Russhard. This work is of interest to researchers and practitioners alike, and is an essential book for most of libraries of higher academic institutes.

Mechanical Vibrations

This is the proceedings of the IUTAM Symposium on Exploiting Nonlinear Dynamics for Engineering Systems that was held in Novi Sad, Serbia, from July 15th to 19th, 2018. The appearance of nonlinear phenomena used to be perceived as dangerous, with a general tendency to avoid them or control them. This perception has led to intensive research using various approaches and tailor-made tools developed over decades. However, the Nonlinear Dynamics of today is experiencing a profound shift of paradigm since recent investigations rely on a different strategy which brings good effects of nonlinear phenomena to the forefront. This strategy has a positive impact on different fields in science and engineering, such as vibration isolation, energy harvesting, micro/nano-electro-mechanical systems, etc. Therefore, the ENOLIDES Symposium was devoted to demonstrate the benefits and to unlock the potential of exploiting nonlinear dynamical behaviour in these but also in other emerging fields of science and engineering. This proceedings is useful for researchers in the fields of nonlinear dynamics of mechanical systems and structures, and in Mechanical and Civil Engineering.

Vibration Problems in Machines

Collection of selected, peer reviewed papers from the 2013 2nd International Conference on Industrial Design and Mechanics Power (ICIDMP 2013) August 24-25, 2013, Nanjing, China. Volume is indexed by Thomson Reuters CPCI-S (WoS). The 216 papers are grouped as follows: Chapter 1: Mechanics, Dynamics of Systems, Structures, Fluids; Chapter 2: System Modeling, Analysis, Simulation, Software; Chapter 3: System Design, Testing, Identification,
Monitoring Technologies; Chapter 4: Materials and Technologies of Material Processing; Chapter 5: Sensors, Measurements, Automation and Controls, Robotics; Chapter 6: Signal and Data Processing, Information Technologies and Communication; Chapter 7: Industrial Design and Engineering Management; Chapter 8: Environmental Engineering and Human Safety; Chapter 9: Related Themes.

Vibration Engineering and Technology of Machinery

"This book enables engineers to understand the dynamics of rotating machines, starting from the most basic explanations and then proceeding to detailed numerical models and analysis"--Provided by publisher.

Dynamics of Multibody Systems

Topics in Modal Analysis & Testing, Volume 9: Proceedings of the 36th IMAC, A Conference and Exposition on Structural Dynamics, 2018, the ninth 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 Modal Analysis, including papers on: Operational Modal & Modal Analysis Applications Experimental Techniques Modal Analysis, Measurements & Parameter Estimation Modal Vectors & Modeling Basics of Modal Analysis Additive Manufacturing & Modal Testing of Printed Parts

Advances in Vibration Engineering and Structural Dynamics

Nowadays, numerical computation has become one of the most vigorous tools for scientists, researchers and professional engineers, following the enormous progress made during the last decades in computing technology, in terms of both computer hardware and software development. Although this has led to tremendous achievements in computer-based structural engineering, the increasing necessity of solving complex problems in engineering requires the development of new ideas and innovative methods for providing accurate numerical solutions in affordable...
computing times. This collection aims at providing a forum for the presentation and discussion of state-of-the-art innovative developments, concepts, methodologies and approaches in scientific computation applied to structural engineering. It involves a wide coverage of timely issues on computational structural engineering with a broad range of both research and advanced practical applications. This Research Topic encompasses, but is not restricted to, the following scientific areas: modeling in structural engineering; finite element methods; boundary element methods; static and dynamic analysis of structures; structural stability; structural mechanics; meshless methods; smart structures and systems; fire engineering; blast engineering; structural reliability; structural health monitoring and control; optimization; and composite materials, with application to engineering structures.

Dynamics of Rotating Machines

Advances in Mechanism and Machine Science

Since 1976, the Vibrations in Rotating Machinery conferences have successfully brought industry and academia together to advance state-of-the-art research in dynamics of rotating machinery. 12th International Conference on Vibrations in Rotating Machinery contains contributions presented at the 12th edition of the conference, from industrial and academic experts from different countries. The book discusses the challenges in rotor-dynamics, rub, whirl, instability and more. The topics addressed include: - Active, smart vibration control - Rotor balancing, dynamics, and smart rotors - Bearings and seals - Noise vibration and harshness - Active and passive damping - Applications: wind turbines, steam turbines, gas turbines, compressors - Joints and couplings - Challenging performance boundaries of rotating machines - High power density machines - Electrical machines for aerospace - Management of extreme events - Active machines - Electric supercharging - Blades and bladed assemblies (forced response, flutter, mistuning) - Fault detection and condition monitoring - Rub, whirl and instability - Torsional vibration Providing the latest research and useful guidance, 12th International Conference on Vibrations in Rotating Machinery aims at those from industry or academia that are involved in transport, power, process, medical
engineering, manufacturing or construction.

Vibration of Structures and Machines

This book offers a collection of original peer-reviewed contributions presented at the 7th International Congress on Design and Modeling of Mechanical Systems (CMSM’2017), held in Hammamet, Tunisia, from the 27th to the 29th of March 2017. It reports on both research findings, innovative industrial applications and case studies concerning mechanical systems and related to modeling and analysis of materials and structures, multiphysics methods, nonlinear dynamics, fluid structure interaction and vibroacoustics, design and manufacturing engineering. Continuing on the tradition of the previous editions, this proceedings offers a broad overview on the state-of-the-art in the field and a useful resource for academic and industry specialists active in the field of design and modeling of mechanical systems. CMSM’2017 was jointly organized by two leading Tunisian research laboratories: the Mechanical, Modeling and Manufacturing Laboratory of the National Engineering School of Sfax and the Mechanical Engineering Laboratory of the National Engineering School of Monastir.

IUTAM Symposium on Exploiting Nonlinear Dynamics for Engineering Systems

The aim of the present book is to address practical aspects of nonlinear vibration analysis. It presents cases rarely discussed in the existing literature on vibration - such as rotor dynamics, and torsional vibration of engines - which are problems of considerable interest for engineering researchers and practical engineers. The book can be used not only as a reference but also as material for graduate students at Engineering departments, as it contains problems and solutions for each chapter.

12th International Conference on Vibrations in Rotating Machinery

Rotating Machinery, Hybrid Test Methods, Vibro-Acoustics & Laser Vibrometry, Volume 8. Proceedings of the 34th
IMAC, A Conference and Exposition on Dynamics of Multiphysical Systems: From Active Materials to Vibroacoustics, 2016, the eighth volume of ten 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 Structural Dynamics, including papers on: • Processing Modal Data • Rotating Machinery • Vibro Acoustics • Laser Vibrometry • Teaching Practices • Hybrid Testing • Reduced Order Modeling

Rotating Machinery, Hybrid Test Methods, Vibro-Acoustics & Laser Vibrometry, Volume 8

Experimental Techniques, Rotating Machinery & Acoustics, Volume 8: Proceedings of the 33rd IMAC, A Conference and Exposition on Structural Dynamics, 2015, the eighth volume of ten 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 Structural Dynamics, including papers on: Experimental Techniques Processing Modal Data Rotating Machinery Acoustics Adaptive Structures Biodynamics Damping

Vibration Problems ICOVP 2011

This book equips the reader to understand every important aspect of the dynamics of rotating machines. Will the vibration be large? What influences machine stability? How can the vibration be reduced? Which sorts of rotor vibration are the worst? The book develops this understanding initially using extremely simple models for each phenomenon, in which (at most) four equations capture the behavior. More detailed models are then developed based on finite element analysis, to enable the accurate simulation of the relevant phenomena for real machines. Analysis software (in MATLAB) is associated with this book, and novices to rotordynamics can expect to make good predictions of critical speeds and rotating mode shapes within days. The book is structured more as a learning guide than as a reference tome and provides readers with more than 100 worked examples and more than 100 problems and solutions.
Proceedings of the 9th IFToMM International Conference on Rotor Dynamics

This book gathers the proceedings of the 15th IFToMM World Congress, which was held in Krakow, Poland, from June 30 to July 4, 2019. Having been organized every four years since 1965, the Congress represents the world’s largest scientific event on mechanism and machine science (MMS). The contributions cover an extremely diverse range of topics, including biomechanical engineering, computational kinematics, design methodologies, dynamics of machinery, multibody dynamics, gearing and transmissions, history of MMS, linkage and mechanical controls, robotics and mechatronics, micro-mechanisms, reliability of machines and mechanisms, rotor dynamics, standardization of terminology, sustainable energy systems, transportation machinery, tribology and vibration. Selected by means of a rigorous international peer-review process, they highlight numerous exciting advances and ideas that will spur novel research directions and foster new multidisciplinary collaborations.

Proceedings of the FISITA 2012 World Automotive Congress

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.

Dynamics of Rotating Machines
This first of three volumes from the inaugural NODYCON, held at the University of Rome, in February of 2019, presents papers devoted to Nonlinear Dynamics of Structures, Systems and Devices. The collection features both well-established streams of research as well as novel areas and emerging fields of investigation. Topics in Volume I include multi-scale dynamics: coexistence of multiple time/space scales, large system dynamics; dynamics of structures/industrial machines/equipment/facilities (e.g., cable transportation systems, suspension bridges, cranes, vehicles); nonlinear interactions: parametric vibrations with single/multi-frequency excitations, multiple external and autoparametric resonances in multi-dof systems; nonlinear system identification: parametric/nonparametric identification, data-driven identification; experimental dynamics: benchmark experiments, experimental methods, instrumentation techniques, measurements in harsh environments, experimental validation of nonlinear models; wave propagation, solitons, kinks, breathers; solution methods for pdes: Lie groups, Hirota’s method, perturbation methods, etc; nonlinear waves in media (granular materials, porous materials, materials with memory); composite structures: multi-layer, functionally graded, thermal loading; fluid/structure interaction; nonsmooth and retarded dynamics: systems with impacts, free play, stick-slip, friction hysteresis; nonlinear systems with time and/or space delays; stability of delay differential equations, differential-algebraic equations; space/time reduced-order modeling: enhanced discretization methods, center manifold reduction, nonlinear normal modes, normal forms; fractional-order systems; computational techniques: efficient algorithms, use of symbolic manipulators, integration of symbolic manipulation and numerical methods, use of parallel processors; and multibody dynamics: rigid and flexible multibody system dynamics, impact and contact mechanics, tire modeling, railroad vehicle dynamics, computational multibody dynamics.

Proceedings of the 10th International Conference on Rotor Dynamics – IFToMM

This book presents the proceedings of the 9th IFToMM International Conference on Rotor Dynamics. This conference is a premier global event that brings together specialists from the university and industry sectors worldwide in order to promote the exchange of knowledge, ideas, and information on the latest developments and applied technologies in the dynamics of rotating machinery. The coverage is wide ranging, including, for example, new ideas and trends in
various aspects of bearing technologies, issues in the analysis of blade dynamic behavior, condition monitoring of
different rotating machines, vibration control, electromechanical and fluid-structure interactions in rotating
machinery, rotor dynamics of micro, nano and cryogenic machines, and applications of rotor dynamics in
transportation engineering. Since its inception 32 years ago, the IFTToMM International Conference on Rotor
Dynamics has become an irreplaceable point of reference for those working in the field and this book reflects the high
quality and diversity of content that the conference continues to guarantee.

Rotating Machinery Vibration

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 13: Noise, Vibration and
Harshness (NVH) focuses on: •Chassis Vibration and Noise Control •Transmission Vibration and Noise Control
•Engine Vibration and Noise Control •Body Vibration and Noise Control •Vehicle Vibration and Noise Control
•Analysis and Evaluation of In-Car Vibration & Noise •Wind Noise Control Technology •Vibration and Noise
Testing Technology 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.

Nonlinear Dynamics of Structures, Systems and Devices

This book consists of selected and peer-reviewed papers presented at the 13th International Conference on Vibration
Problems (ICOVP 2017). The topics covered in this book are broadly related to the fields of structural health monitoring, vibration control and rotor dynamics. In the structural health monitoring section studies on nonlinear dynamic analysis, damage identification, viscoelastic model of concrete, and seismic damage assessment are thoroughly discussed with analytical and numerical techniques. The vibration control part includes topics such as multi-storeyed stacked tuned mass dampers, vibration isolation with elastomeric mounts, and nonlinear active vibration absorber. This book will be useful for beginners, researchers and professionals interested in the field of vibration control, structural health monitoring and rotor dynamics.

Advances in Rotor Dynamics, Control, and Structural Health Monitoring

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

Design and Modeling of Mechanical Systems—III

This book highlights recent findings in industrial, manufacturing and mechanical engineering, and provides an overview of the state of the art in these fields, mainly in Russia and Eastern Europe. A broad range of topics and issues in modern engineering are discussed, including the dynamics of machines and working processes, friction, wear and lubrication in machines, surface transport and technological machines, manufacturing engineering of industrial facilities, materials engineering, metallurgy, control systems and their industrial applications, industrial mechatronics, automation and robotics. The book gathers selected papers presented at the 5th International Conference on Industrial Engineering (ICIE), held in Sochi, Russia in March 2019. The authors are experts in various fields of
engineering, and all papers have been carefully reviewed. Given its scope, the book will be of interest to a wide
readership, including mechanical and production engineers, lecturers in engineering disciplines, and engineering
graduates.

Hydrodynamics of Pumps

The aim of this book is to present recent and innovative advances on research studies and engineering applications in
important areas of vibration engineering and structural dynamics. The fourteen chapters of the book cover a wide
range of interesting issues related to modelling, rotordynamics, vibration control, estimation and identification, modal
analysis, dynamic structures, finite element analysis, numerical methods and other practical engineering applications
and theoretical developments on this very broad matter. The audience of the book includes researchers, professors,
engineers, practitioners, engineering students and new comers in a variety of disciplines seeking to know more about
the state of the art, challenging open problems and innovative solution proposals in vibration engineering and
structural dynamics.

Rotating Machinery and Vehicle Dynamics

Multibody systems are the appropriate models for predicting and evaluating performance of a variety of dynamical
systems such as spacecraft, vehicles, mechanisms, robots or biomechanical systems. This book addresses the general
problem of analysing the behaviour of such multibody systems by digital simulation. This implies that pre-computer
analytical methods for deriving the system equations must be replaced by systematic computer oriented formalisms,
which can be translated conveniently into efficient computer codes for - generating the system equations based on
simple user data describing the system model - solving those complex equations yielding results ready for design
evaluation. Emphasis is on computer based derivation of the system equations thus freeing the user from the time
consuming and error-prone task of developing equations of motion for various problems again and again.
Industrial Design and Mechanics Power II

This volume contains the Proceedings of the First International Conference of IFToMM Italy (IFIT2016), held at the University of Padova, Vicenza, Italy, on December 1-2, 2016. The book contains contributions on the latest advances on Mechanism and Machine Science. The fifty-nine papers deal with such topics as biomechanical engineering, history of mechanism and machine science, linkages and mechanical controls, multi-body dynamics, reliability, robotics and mechatronics, transportation machinery, tribology, and vibrations.

Experimental Techniques, Rotating Machinery, and Acoustics, Volume 8

This volume gathers the latest advances, innovations and applications in the field of condition monitoring, plant maintenance and reliability, as presented by leading international researchers and engineers at the 5th International Conference on Maintenance Engineering and the 2020 Annual Conference of the Centre for Efficiency and Performance Engineering Network (IncoME-V & CEPE Net-2020), held in Zhuhai, China on October 23-25, 2020. Topics include vibro-acoustics monitoring, condition-based maintenance, sensing and instrumentation, machine health monitoring, maintenance auditing and organization, non-destructive testing, reliability, asset management, condition monitoring, life-cycle cost optimisation, prognostics and health management, maintenance performance measurement, manufacturing process monitoring, and robot-based monitoring and diagnostics. 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.

Topics in Modal Analysis & Testing, Volume 9

"Without doubt the best modern and up-to-date text on the topic, written by one of the world leading experts in the field. Should be on the desk of any practitioner or researcher involved in the field of Machine Condition Monitoring"
Simon Braun, Israel Institute of Technology

Explaining complex ideas in an easy to understand way, Vibration-based
Condition Monitoring provides a comprehensive survey of the application of vibration analysis to the condition monitoring of machines. Reflecting the natural progression of these systems by presenting the fundamental material and then moving onto detection, diagnosis and prognosis, Randall presents classic and state-of-the-art research results that cover vibration signals from rotating and reciprocating machines; basic signal processing techniques; fault detection; diagnostic techniques, and prognostics. Developed out of notes for a course in machine condition monitoring given by Robert Bond Randall over ten years at the University of New South Wales, Vibration-based Condition Monitoring: Industrial, Aerospace and Automotive Applications is essential reading for graduate and postgraduate students/ researchers in machine condition monitoring and diagnostics as well as condition monitoring practitioners and machine manufacturers who want to include a machine monitoring service with their product. Includes a number of exercises for each chapter, many based on Matlab, to illustrate basic points as well as to facilitate the use of the book as a textbook for courses in the topic. Accompanied by a website www.wiley.com/go/randall housing exercises along with data sets and implementation code in Matlab for some of the methods as well as other pedagogical aids. Authored by an internationally recognised authority in the area of condition monitoring.

Nonlinear Dynamics, Volume 1

Proceedings of the NATO Advanced Study Institute on Vibration and Wear Damage in High Speed Rotating Machinery, Tróia, Sebútal, April 10-22, 1989

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