

Design And Optimization Of Planetary Gears Under

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Advances in Smart Vehicular Technology, Transportation, Communication and Applications - Jeng-Shyang Pan 2017-11-01

This book presents papers from the First International Conference on Smart Vehicular Technology, Transportation, Communication and Applications (VTCA 2017). Held from 6 to 8 November 2017 in Kaohsiung, Taiwan, the conference was co-sponsored by Springer, Fujian University of Technology in China, Fujian Provincial Key Laboratory of Digital Equipment, Fujian Provincial Key Lab of Big Data Mining and Applications, and National Kaohsiung University of Applied Sciences in Taiwan. The book is a valuable resource for researchers and professionals engaged in all areas of smart vehicular technology, vehicular transportation, vehicular communication, and applications.

Scientific and Technical Aerospace Reports - 1994

Rotating Machinery, Hybrid Test Methods, Vibro-Acoustics & Laser Vibrometry, Volume 8 - James De Clerck 2016-06-29

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

Manufacturing Process and Equipment - Xiang Hua Liu 2013-05-14

Selected, peer reviewed papers from the 2013 International Conference on Manufacturing Science and Engineering (4th ICMSE 2013), March 30-31, 2013, Dalian, China

Pervasive Computing and the Networked World - Qiaohong Zu 2013-03-14

This book constitutes the refereed post-proceedings of the Joint International Conference on Pervasive Computing and the Networked World, ICPCA-SWS 2012, held in Istanbul, Turkey, in November 2012. This conference is a merger of the 7th International Conference on Pervasive Computing and Applications (ICPCA) and the 4th Symposium on Web Society (SWS). The 53 revised full papers and 26 short papers presented were carefully reviewed and selected from 143 submissions. The papers cover a wide range of topics from different research communities such as computer science, sociology and psychology and explore both theoretical and practical issues in and around the emerging computing paradigms, e.g., pervasive collaboration, collaborative business, and networked societies. They highlight the unique characteristics of the "everywhere" computing paradigm and promote the awareness of its potential social and psychological consequences.

Advanced Technologies in Manufacturing, Engineering and Materials - Yun Hae Kim 2013-09-04

Selected, peer reviewed papers from the 2013 International Forum on Mechanical and Material Engineering (IFMME 2013), June 13-14, Guangzhou, China

Advances in Mechanism and Machine Science - Tadeusz Uhl 2019-06-13

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.

Multibody Mechatronic Systems - João Carlos Mendes Carvalho 2017-09-29

These are the Proceedings of the 6th International Symposium on Multibody Systems and Mechatronics (MUSME 2017) which was held in Florianópolis, Brazil, October 24-28, 2017. Topics addressed include analysis and synthesis of mechanisms; dynamics of multibody systems; design algorithms for mechatronic systems; simulation procedures and results; prototypes and their performance; robots and micromachines; experimental validations; theory of mechatronic simulation; mechatronic systems; and control of mechatronic systems. The MUSME 2017 Symposium was one of the activities of the FEIbIM Commission for Mechatronics and IFToMM technical Committees for Multibody Dynamics, Robotics and Mechatronics. Planetary Gear Trains - Kiril Arnaudov 2019-03-27

This book provides comprehensive information for various planetary gear trains, with practical applications and comprehensive references to technical articles. In the text's chapters, readers can find all the information needed for various types of gear trains, with illustrations and examples. The authors help gear designers to creatively understand the design of gears, as well as master the mechanical calculations needed. Planetary Gear Trains is the most comprehensive and up-to-date work available in this key technical area. The book reflects not only teaching, but also the practical experience of the authors. It was developed under the motto "From practice to practice".

Mechanism Design for Robotics - Alessandro Gasparetto 2018-08-30

This volume contains the Proceedings of the 4th IFToMM Symposium on Mechanism Design for Robotics, held in Udine, Italy, 11-13 September, 2018. It includes recent advances in the design of mechanisms and their robotic applications. It treats, among others, the following topics: mechanism design, mechanics of robots, parallel manipulators, actuators and their control, linkage and industrial manipulators, innovative mechanisms/robots and their applications. This book can be used by students, researchers and engineers in the relevant areas of mechanisms, machines and robotics.

New Approaches to Gear Design and Production - Veniamin Goldfarb 2020-01-25

This is the third book in a series devoted to gear design and production. Comprising papers by scientists and gear experts from around the globe, it covers recent developments in practically all spheres of mechanical engineering related to gears and transmissions. It describes advanced approaches to research, design, testing and production of various kinds of gears for a vast range of applications, with a particular focus on advanced computer-aided approaches for gear analysis, simulation and design, the application of new materials and tribological issues.

Planetary Gear Trains - Kiril Arnaudov 2019-03-27

This book provides comprehensive information for various planetary gear trains, with practical applications and comprehensive references to technical articles. In the text's chapters, readers can find all the information needed for various types of gear trains, with illustrations and examples. The authors help gear designers to creatively understand the design of gears, as well as master the mechanical calculations needed. Planetary Gear Trains is the most comprehensive and up-to-date work available in this key technical area. The book reflects not only teaching, but also the practical experience of the authors. It was developed under the motto "From practice to practice".

Nature-Inspired Optimization in Advanced Manufacturing Processes and Systems - Ganesh M. Kakandikar 2020-12-15

Nature-Inspired Optimization in Advanced Manufacturing Processes and Systems Subject Guide: Engineering—Industrial and Manufacturing The manufacturing system is going through substantial changes and developments in light of Industry 4.0. Newer manufacturing technologies are being developed and applied. There is a need to optimize these techniques when applied in different circumstances with respect to materials, tools, product configurations, and process parameters. This book covers computational intelligence applied to manufacturing. It discusses nature-inspired optimization of processes and the design and development in manufacturing systems. It explores all manufacturing processes, at both macro and micro levels, and offers manufacturing philosophies. Nonconventional manufacturing, real industry problems and case studies, research on generative processes, and relevance of all this to Industry 4.0, is also included. Researchers, students, academicians, and industry professionals will find this reference title very useful.

Recent Advances in Mechanical Engineering - K.M. Pandey 2021-01-10

This book presents the select proceedings of the International Conference on Recent Advancements in Mechanical Engineering (ICRAME 2020). It provides a comprehensive overview of the various technical challenges faced, their systematic investigation, contemporary developments, and future perspectives in the domain of mechanical engineering. The book covers a wide array of topics including fluid flow techniques, compressible flows, waste management and waste disposal, bio-fuels, renewable energy, cryogenic applications, computing in applied mechanics, product design, dynamics and control of structures, fracture and failure mechanics, solid mechanics, finite element analysis, tribology, nano-mechanics and MEMS, robotics, supply chain management and logistics, intelligent manufacturing system, rapid prototyping and reverse engineering, quality control and reliability, conventional and non-conventional machining, and ergonomics. This book can be useful for students and researchers interested in mechanical engineering and its allied fields.

Power Transmissions - Datong Qin 2016-11-10

This book presents papers from the International Conference on Power Transmissions 2016, held in Chongqing, China, 27th-30th October 2016. The main objective of this conference is to provide a forum for the most recent advances, addressing the challenges in modern mechanical transmissions. The conference proceedings address all aspects of gear and power transmission technology and a range of applications. The presented papers are catalogued into three main tracks, including design, simulation and testing, materials and manufacturing, and industrial applications. The design, simulation and testing track covers topics such as new methods and designs for all types of transmissions, modelling and simulation of power transmissions, strength, fatigue, dynamics and reliability of power transmissions, lubrication and sealing technologies and theories, and fault diagnosis of power transmissions. In the materials and manufacturing track, topics include new materials and heat treatment of power transmissions, new manufacturing technologies of power transmissions, improved tools to predict future demands on production systems, new technologies for ecologically sustainable productions and those which preserve natural resources, and measuring technologies of power transmissions. The proceedings also cover the novel industrial applications of power transmissions in marine, aerospace and railway contexts, wind turbines, the automotive industry, construction machinery, and robots.

Recent Advances in Evolutionary Multi-objective Optimization - Slim Bechikh 2016-08-09

This book covers the most recent advances in the field of evolutionary multiobjective optimization. With the

aim of drawing the attention of up-and coming scientists towards exciting prospects at the forefront of computational intelligence, the authors have made an effort to ensure that the ideas conveyed herein are accessible to the widest audience. The book begins with a summary of the basic concepts in multi-objective optimization. This is followed by brief discussions on various algorithms that have been proposed over the years for solving such problems, ranging from classical (mathematical) approaches to sophisticated evolutionary ones that are capable of seamlessly tackling practical challenges such as non-convexity, multi-modality, the presence of multiple constraints, etc. Thereafter, some of the key emerging aspects that are likely to shape future research directions in the field are presented. These include: optimization in dynamic environments, multi-objective bilevel programming, handling high dimensionality under many objectives, and evolutionary multitasking. In addition to theory and methodology, this book describes several real-world applications from various domains, which will expose the readers to the versatility of evolutionary multi-objective optimization.

Simulated Evolution and Learning - Kalyanmoy Deb 2010-11-16

evolutionary - gorithms. Manindra Agrawal's talk on "PRIMES is in P" provided a mu- improved version of his celebrated and ground-breaking 2002 work on poly- mial time algorithm for testing prime numbers. The theoretical computation work presented in this keynote lecture should be motivating for the evolutionary optimization and machine learning community at large.

Power Transmissions - George Dobre 2013-07-11

This books contains the Proceedings of the 4th International Conference on Power Transmissions, that was held in Sinaia, Romania from June 20 -23, 2012. Power Transmissions is a very complex and multi-disciplinary scientific field of Mechanical Engineering that covers the different types of transmissions (mechanical, hydraulic, pneumatic) as well as all the machine elements involved, such as gears, bearings, shafts, couplings and a lot more. It concerns not only their basic theory but also their design, analysis, testing, application and maintenance. The requirements set to modern power transmissions are really tough to meet: They need to be more efficient, stronger, smaller, noiseless, easier to produce and to cost less. There is a strong demand to become easier in operation and maintenance, or even automatic and in maintenance-free. Last but not least, they should be easily recycled and respect the environment. Joint efforts of specialists from both academia and industry can significantly contribute to fulfill these needs. The main goal of this conference was to bring together experts from all over the world and present the latest developments in the field of Power Transmissions.

Controller Tuning Optimization Methods for Multi-Constraints and Nonlinear Systems - Maude Josée Blondin 2021-01-06

This book covers controller tuning techniques from conventional to new optimization methods for diverse control engineering applications. Classical controller tuning approaches are presented with real-world challenges faced in control engineering. Current developments in applying optimization techniques to controller tuning are explained. Case studies of optimization algorithms applied to controller tuning dealing with nonlinearities and limitations like the inverted pendulum and the automatic voltage regulator are presented with performance comparisons. Students and researchers in engineering and optimization interested in optimization methods for controller tuning will utilize this book to apply optimization algorithms to controller tuning, to choose the most suitable optimization algorithm for a specific application, and to develop new optimization techniques for controller tuning.

Industrializing Additive Manufacturing - Mirko Meboldt 2020-09-01

This book contains the proceedings of the Additive Manufacturing in Product Development Conference. The content focus on how to support real-world value chains by developing additive manufactured series products.

Methode zur Beschreibung und Optimierung des Anregungsverhaltens von Planetengetrieben - Daniel Piel 2020-11-19

Planetengetriebe finden eine breite Anwendung in modernen Antriebssystemen. Dabei nimmt der Fokus auf ein geringes Anregungsverhalten stetig zu. Im Rahmen dieser Dissertation sind zunächst Untersuchungen zum Anregungsverhalten auf einem Prüfstand durchgeführt worden. Dabei hat sich der Gesamtdrehfehler als Beschreibungsgröße für das Anregungsverhalten identifizieren lassen. Ergänzend ist eine Methode zur

Beschreibung des Anregungsverhaltens von Planetengetrieben entwickelt worden.
Computers in Engineering 1989: Knowledge-based systems, computer-aided engineering, design optimization, computer simulation of mechanical systems, computer graphics, robotics, specialty process controls and data acquisition systems - Donald R. Riley 1989

Advances in Modeling and Simulation in Textile Engineering - Nicholus Tayari Akankwasa
2021-03-28

Advances in Modeling and Simulation in Textile Engineering: New Concepts, Methods, and Applications explains the advanced principles and techniques that can be used to solve textile engineering problems using numerical modeling and simulation. The book draws on innovative research and industry practice to explain methods for the modeling of all of these processes, helping readers apply computational power to more areas of textile engineering. Experimental results are presented and linked closely to processes and methods of implementation. Diverse concepts such as heat transfer, fluid dynamics, three-dimensional motion, and multi-phase flow are addressed. Finally, tools, theoretical principles, and numerical models are extensively covered. Textile engineering involves complex processes which are not easily expressed numerically or simulated, such as fiber motion simulation, yarn to fiber formation, melt spinning technology, optimization of yarn production, textile machinery design and optimization, and modeling of textile/fabric reinforcements. Provides new approaches and techniques to simulate a wide range of textile processes from geometry to manufacturing Includes coverage of detailed mathematical methods for textiles, including neural networks, genetic algorithms, and the finite element method Addresses modeling techniques for many different phenomena, including heat transfer, fluid dynamics and multi-phase flow
Optimization and Optimal Control in Automotive Systems - Harald Waschl 2014-03-20

This book demonstrates the use of the optimization techniques that are becoming essential to meet the increasing stringency and variety of requirements for automotive systems. It shows the reader how to move away from earlier approaches, based on some degree of heuristics, to the use of more and more common systematic methods. Even systematic methods can be developed and applied in a large number of forms so the text collects contributions from across the theory, methods and real-world automotive applications of optimization. Greater fuel economy, significant reductions in permissible emissions, new drivability requirements and the generally increasing complexity of automotive systems are among the criteria that the contributing authors set themselves to meet. In many cases multiple and often conflicting requirements give rise to multi-objective constrained optimization problems which are also considered. Some of these problems fall into the domain of the traditional multi-disciplinary optimization applied to system, sub-system or component design parameters and is performed based on system models; others require applications of optimization directly to experimental systems to determine either optimal calibration or the optimal control trajectory/control law. Optimization and Optimal Control in Automotive Systems reflects the state-of-the-art in and promotes a comprehensive approach to optimization in automotive systems by addressing its different facets, by discussing basic methods and showing practical approaches and specific applications of optimization to design and control problems for automotive systems. The book will be of interest both to academic researchers, either studying optimization or who have links with the automotive industry and to industrially-based engineers and automotive designers.

Integrated Powertrains and Their Control - Nick Vaughan 2001-06-22

An invaluable overview of the latest powertrain technology Integrated Powertrains and Their Control provides an overview of the latest in powertrain technology from an expert in the field. Based on current and ongoing research, this book updates the field's body of knowledge by highlighting new advances in design, modeling, and simulation as well as implementation considerations dictated by new and evolving legal requirements. Relevant to mechanical engineers in both research and industry, this book provides valuable insight and directions for future investigations.

Dynamics and Vibration Analyses of Gearbox in Wind Turbine - Qingkai Han 2016-09-27

This book explores the dynamics and vibration properties of gearboxes, with a focus on geared rotor systems. It discusses mechanical theories, finite-element based simulations, experimental measurements and vibration signal processing techniques. It introduces the vibration-resonance calculation method for the

geared rotor system in wind turbines and load sharing of the planetary gear train, and offers a method for calculating the vibrations of geared rotor systems under either internal excitations from gear sets or external loads transferred from wind loads. It also defines and elaborates on parameter optimization for planetary gear systems based on the torsional dynamics of wind-turbine geared rotor systems. Moreover, it describes experimental measurements of vibrations on the wind-turbine gearbox performed on the test rig and on site, and analyzes the vibration signals of different testing points, showing them in both time and frequency domains. Lastly, it lists the gear coupling frequencies and fault characteristic frequencies from the vibrations of the gearbox housing. The technologies and results presented are valuable resources for use in dynamic design, vibration prediction and analysis of gearboxes and geared rotor systems in wind turbines as well as many other machines.

Proceedings of the 4th International Congress of Automotive and Transport Engineering (AMMA 2018) - Nicolae Burnete 2018-09-29

This volume includes selected and reviewed papers from the 4th International Congress of Automotive and Transport Engineering, held in Cluj, Romania, in September 2018. Authors are experts from research, industry and universities coming from 14 countries worldwide. The papers are covering the latest developments in automotive vehicles and environment, advanced transport systems and road traffic, heavy and special vehicles, new materials, manufacturing technologies and logistics, accident research and analysis and innovative solutions for automotive vehicles. The conference is organized by SIAR (Society of Automotive Engineers from Romania) in cooperation with FISITA.

Research into Design for Communities, Volume 1 - Amaresh Chakrabarti 2017-02-24

This book showcases cutting-edge research papers from the 6th International Conference on Research into Design (ICoRD 2017) - the largest in India in this area - written by eminent researchers from across the world on design process, technologies, methods and tools, and their impact on innovation, for supporting design for communities. While design traditionally focused on the development of products for the individual, the emerging consensus on working towards a more sustainable world demands greater attention to designing for and with communities, so as to promote their sustenance and harmony - within each community and across communities. The special features of the book are the insights into the product and system innovation process, and the host of methods and tools from all major areas of design research for the enhancement of the innovation process. The main benefit of the book for researchers in various areas of design and innovation are access to the latest quality research in this area, with the largest collection of research from India. For practitioners and educators, it is exposure to an empirically validated suite of theories, models, methods and tools that can be taught and practiced for design-led innovation. The contents of this volume will be of use to researchers and professionals working in the areas on industrial design, manufacturing, consumer goods, and industrial management.

Handbook of Nature-inspired Optimization Algorithms - Ali Wagdy Mohamed

This book presents recent contributions and significant development, advanced issues, and challenges. In real-world problems and applications, most of the optimization problems involve different types of constraints. These problems are called constrained optimization problems (COPs). The optimization of the constrained optimization problems is considered a challenging task since the optimum solution(s) must be feasible. In their original design, evolutionary algorithms (EAs) are able to solve unconstrained optimization problems effectively. As a result, in the past decade, many researchers have developed a variety of constraint handling techniques, incorporated into (EAs) designs, to counter this deficiency. The main objective for this book is to make available a self-contained collection of modern research addressing the general constrained optimization problems in many real-world applications using nature-inspired optimization algorithms. This book is suitable for a graduate class on optimization, but will also be useful for interested senior students working on their research projects.

Advances in Mechanical Systems Dynamics - Alberto Doria 2020-02-13

Modern dynamics was established many centuries ago by Galileo and Newton before the beginning of the industrial era. Presently, we are in the presence of the fourth industrial revolution, and mechanical systems are increasingly being integrated with electronic, electrical, and fluidic systems. This trend is present not only in the industrial environment, which will soon be characterized by the cyber-physical systems of

industry 4.0, but also in other environments like mobility, health and bio-engineering, food and natural resources, safety, and sustainable living. In this context, purely mechanical systems with quasi-static behavior will become less common and the state-of-the-art will soon be represented by integrated mechanical systems, which need accurate dynamic models to predict their behavior. Therefore, mechanical system dynamics are going to play an increasingly central role. Significant research efforts are needed to improve the identification of the mechanical properties of systems in order to develop models that take non-linearity into account, and to develop efficient simulation tools. This Special Issue aims at disseminating the latest research achievements, findings, and ideas in mechanical systems dynamics, with particular emphasis on applications that are strongly integrated with other systems and require a multi-physical approach.

Analysis and Design of the Power-Split Device for Hybrid Systems - Xiaohua Zeng 2017-10-04

This book presents a comprehensive overview of power-split device (PSD) design. It discusses vehicle energy consumption characteristics, hybrid vehicle power request solutions, typical configurations, operating principle and simulation technology of PSD hybrid system, a multi-factor integrated parametric design method and a dynamic coordinated control method for PSD hybrid system. It also describes the finite element analysis, thermal analysis and optimization of the PSD based on a surrogate model, explains the theory behind the design and the simulation, and provides concrete examples. It is a valuable resource for researchers and the engineers to gain a better understanding of the PSD design process.

Mechanical Design Optimization Using Advanced Optimization Techniques - R. Venkata Rao 2012-01-15

Mechanical design includes an optimization process in which designers always consider objectives such as strength, deflection, weight, wear, corrosion, etc. depending on the requirements. However, design optimization for a complete mechanical assembly leads to a complicated objective function with a large number of design variables. It is a good practice to apply optimization techniques for individual components or intermediate assemblies than a complete assembly. Analytical or numerical methods for calculating the extreme values of a function may perform well in many practical cases, but may fail in more complex design situations. In real design problems, the number of design parameters can be very large and their influence on the value to be optimized (the goal function) can be very complicated, having nonlinear character. In these complex cases, advanced optimization algorithms offer solutions to the problems, because they find a solution near to the global optimum within reasonable time and computational costs. Mechanical Design Optimization Using Advanced Optimization Techniques presents a comprehensive review on latest research and development trends for design optimization of mechanical elements and devices. Using examples of various mechanical elements and devices, the possibilities for design optimization with advanced optimization techniques are demonstrated. Basic and advanced concepts of traditional and advanced optimization techniques are presented, along with real case studies, results of applications of the proposed techniques, and the best optimization strategies to achieve best performance are highlighted. Furthermore, a novel advanced optimization method named teaching-learning-based optimization (TLBO) is presented in this book and this method shows better performance with less computational effort for the large scale problems. Mechanical Design Optimization Using Advanced Optimization Techniques is intended for designers, practitioners, managers, institutes involved in design related projects, applied research workers, academics, and graduate students in mechanical and industrial engineering and will be useful to the industrial product designers for realizing a product as it presents new models and optimization techniques to make tasks easier, logical, efficient and effective. .

Theory of Gearing - Stephen P. Radzevich 2012-07-19

The first book of its kind, Theory of Gearing: Kinematics, Geometry, and Synthesis systematically develops a scientific theory of gearing that makes it possible to synthesize novel gears with the desired performance. Written by a leading gearing expert who holds more than 200 patents, it presents a modern methodology for gear design. The proposed theory is based on a key postulate: all the design parameters for an optimal gear pair for a particular application can be derived from (a) a given configuration of the rotation vectors of the driving and driven shafts and (b) the power transmitted by the gear pair. This allows engineers to synthesize the desired gear pairs with only the following input information: The rotation and torque on the

driving shaft The configuration of the driven shaft in relation to the driving shaft The desired rotation and torque of the driven shaft Beginning with the fundamentals, the book reconsiders the basic theory of kinematics and geometry of gears to provide a sound basis for the evaluation and development of future designs. It then examines ideal and real gearing for parallel-axis, intersected-axis, and crossed-axis gearing. The book addresses how to minimize vibration and noise in gears, discusses aspects of implementing the theory of gearing, and analyzes principal features of power transmission and the loading of gear teeth. More than 500 figures clearly illustrate the principles. This is an invaluable resource for engineers and researchers who work in gear design, gear production, and the application of gears as well as for students in mechanical and manufacturing engineering. Covering all known gear designs, this book offers an analytical solution to the problem of designing optimal gear pairs for any given application. It also encourages researchers to further develop the theory of gearing.

Distinguished Figures in Mechanism and Machine Science: Their Contributions and Legacies - Marco Ceccarelli 2007-06-26

This is the first part of a series of books whose aim is to collect contributed papers describing the work of famous persons in MMS (Mechanism and Machine Science). The current work treats mainly technical developments in the historical evolution of the fields that today are grouped in MMS. The emphasis is on biographical notes describing the efforts and experiences of people who have contributed to technical achievements.

Advances in Mechanical Design - Jianrong Tan 2019-09-14

Focusing on innovation, these proceedings present recent advances in the field of mechanical design in China and offer researchers, scholars and scientists an international platform for presenting their research findings and exchanging ideas. Gathering outstanding papers from the 2019 International Conference on Mechanical Design (2019 ICMD) and the 20th Mechanical Design Annual Conference, the content is divided into six major sections: industrial design, reliability design, green design, intelligent design, bionic design and innovative design. Readers will learn about the latest trends, cutting-edge findings and hot topics in the field of design.

Proceedings of the FISITA 2012 World Automotive Congress - SAE-China 2012-11-06

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.

Advanced Wind Turbine Technology - Weifei Hu 2018-05-07

This book introduces the current challenges in modern wind turbine analysis, design and development, and provides a comprehensive examination of state-of-the-art technologies from both academia and industry. The twelve information-rich chapters cover a wide range of topics including reliability-based design, computational fluid dynamics, gearbox and bearing analyses, lightning analysis, structural dynamics, health condition monitoring, advanced techniques for field repair, offshore floating wind turbines, advanced turbine control and grid integration, and other emerging technologies. Each chapter begins with the current status of technology in a lucid, is easy-to-follow treatment, then elaborates on the corresponding advanced technology using detailed methodologies, graphs, mathematical models, computational

simulations, and experimental instrumentation. Relevant to a broad audience from students and faculty to researchers, manufacturers, and wind energy engineers and designers, the book is ideal for both educational and research needs. Presents the latest developments in reliability-based design optimization, CFD of wind turbines, structural dynamics for wind turbine blades, off-shore floating wind turbines, advanced wind turbine control, and wind power and ramp forecasting for grid integration; Includes techniques for wind turbine gearboxes and bearings, evaluation of lightning strike damage, health condition monitoring and reparation techniques; Illustrates theories and operational considerations using graphics, tables, computational algorithms, simulation models, and experimental instrumentation; Examines unique, innovative technologies for wind energy.

Mechanics and Materials Science - Tao Chin-wang 2017-09-25

The 2016 International Conference on Mechanics and Materials Science (MMS2016) was held in Guangzhou, China on October 15-16, 2016. Aimed at providing an excellent international academic forum for all the researchers and practitioners, the conference attracted a wide spread participation among all over the universities and research institutes. MMS2016 features unique mixed topics of Mechatronics and Automation, Materials Science and Engineering, Materials Properties, Measuring Methods and Applications. This volume consists of 159 peer-reviewed articles by local and foreign eminent scholars, which cover the frontiers and hot topics in the relevant areas.

Recent Advances in Gearing - Stephen P. Radzevich 2021-06-24

This book presents the most up-to-date accomplishments in gear design and gear production, detailing theory of gearing and its application. As an enormous number of gears are used in such sectors as automobiles, aerospace, machines, and similar industries, even a very small improvement in the gear design or production, for example a 10 cent savings on each gear, can result in huge of savings in manufacturing, underscoring critical importance of the subject of the book. Giving a solid background in theory together with the latest advances in design and production, the book is ideal for product designers

working in numerous industries. The volume also serves as a useful supplement to required texts well for students in mechanical and industrial engineering as it helps establish a scientific foundation to the subject, and facilitates a systematic learning process of gear kinematics, gear geometry, gear design, gear production/finishing operations, and related competencies.

Direct Gear Design - Alexander L. Kapelevich 2013-03-22

Over the last several decades, gearing development has focused on improvements in materials, manufacturing technology and tooling, thermal treatment, and coatings and lubricants. In contrast, gear design methods have remained frozen in time, as the vast majority of gears are designed with standard tooth proportions. This over-standardization significantly limits the potential performance of custom gear drives, especially in demanding aerospace or automotive applications. Direct Gear Design introduces an alternate gear design approach to maximize gear drive performance in custom gear applications. Developed by the author, the Direct Gear Design® method has been successfully implemented in a wide variety of custom gear transmissions over the past 30 years. The results are maximized gear drive performance, increased transmission load capacity and efficiency, and reduced size and weight. This book explains the method clearly, making it easy to apply to actual gear design. Describes the origin and theoretical foundations of the Direct Gear Design approach as well as some of its applications—and its limits Details the optimization techniques and the specifics of Direct Gear Design Discusses how this approach can be used with asymmetric gears to further improve performance Describes tolerance selection, manufacturing technologies, and measurement methods of custom gears Compares Direct Gear Design with traditional gear design from both an analytical and an experimental perspective Illustrates the applicability and benefits of this gear design approach with implementation examples Written by an engineer for engineers, this book presents a unique alternative to traditional gear design. It inspires readers to explore ways of improving gear transmission performance in custom gear applications, from higher transmission load capacity, efficiency, and reliability to lower size, weight, and cost.