

Mechanics Machines W L Cleghorn

Originating from a Dagstuhl seminar, the collection of papers presented in this book constitutes on the one hand a representative state-of-the-art survey of embodied artificial intelligence, and on the other hand the papers identify the important research trends and directions in the field. Following an introductory overview, the 23 papers are organized into topical sections on - philosophical and conceptual issues - information, dynamics, and morphology - principles of embodiment for real-world applications - developmental approaches - artificial evolution and self-reconfiguration

Mechanics of Machines covers the basic concepts of gears, gear trains, the mechanics of rigid bodies, and graphical and analytical kinematic analyses of planar mechanisms. In addition, the text describes a procedure for designing disc cam mechanisms, discusses graphical and analytical force analyses and balancing of planar mechanisms, and illustrates common methods for the synthesis of mechanisms. Each chapter concludes with a selection of problems of varying length and difficulty. SI Units and US Customary Units are employed. An appendix presents twenty-six design projects based on practical, real-world engineering situations. These may be ideally solved using Working Model software. Readership: Undergraduates taking courses in kinematics and dynamics of machines.

Comprehensive look at mechanical molecular devices that mimic the behavior of man-made devices Molecular devices and molecular machines are individual molecules and molecular systems capable of providing valuable device-like functions. Many of them have distinct conventional prototypes and therefore can be identified as technomimetic molecules. The last decade has seen an increasing rate of practical applications of molecular devices and machines, primarily in biomedical and material science fields. Molecular devices: An Introduction to Technomimetics and its Biological Applications focuses on mechanical molecular devices, including the early set of technomimetic molecules. Topics covered include the many simple molecular devices such as container compounds, gearing systems, belts and tubes, and tweezers. It touches upon each molecular machine and discusses in great detail the importance of their applications as well as the latest progress in the fields of chemistry, physics, and biotechnology. Interdisciplinary: Must-have content for physicists, chemists, and biologists Comprehensive: Details an extensive set of mechanical technomimetic molecular devices Thorough: Starts with the fundamental material characterization and finishes with real-world device application Molecular devices: An Introduction to Technomimetics and its Biological Applications is an important book for graduate students, researchers, scientists, and engineers in the fields of chemistry, materials science, molecular physics, engineering, biotechnology, and molecular medicine.

Applied Chemical Engineering Thermodynamics provides the undergraduate and graduate student of chemical engineering with the basic knowledge, the methodology and the references he needs to apply it in industrial practice. Thus, in addition to the classical topics of the laws of thermodynamics, pure component and mixture thermodynamic properties as well as phase and chemical equilibria the reader will find: - history of thermodynamics - energy conservation - intermolecular forces and molecular thermodynamics - cubic equations of state - statistical mechanics. A great number of calculated problems with solutions and an appendix with numerous tables of numbers of practical importance are extremely helpful for applied calculations. The computer programs on the included disk help the student to become familiar with the typical methods used in industry for volumetric and vapor-liquid equilibria calculations.

This book is a collection of papers presented at Acoustics and Vibration of Mechanical Structures 2017 – AVMS 2017 – highlighting the current trends and state-of-the-art developments in the field. It covers a broad range of topics, such as noise and vibration control, noise and vibration generation and propagation, the effects of noise and vibration, condition monitoring and vibration testing, modeling, prediction and simulation of noise and vibration, environmental and occupational noise and vibration, noise and vibration attenuators, as well as biomechanics and bioacoustics. The book also presents analytical, numerical and experimental techniques for evaluating linear and non-linear noise and vibration problems (including strong nonlinearity). It is primarily intended for academics, researchers and professionals, as well as PhD students in various fields of the acoustics and vibration of mechanical structures.

This volume contains the Proceedings of the 3rd IFToMM Symposium on Mechanism Design for Robotics, held in Aalborg, Denmark, 2-4 June, 2015. The book contains papers on recent advances in the design of mechanisms and their robotic applications. It treats the following topics: mechanism design, mechanics of robots, parallel manipulators, actuators and their control, linkage and industrial manipulators, innovative mechanisms/robots and their applications, among others. The book can be used by researchers and engineers in the relevant areas of mechanisms, machines and robotics.

Human lactation has evolved to produce a milk composition that is uniquely-designed for the human infant. Not only does human milk optimize infant growth and development, it also provides protection from infection and disease. More recently, the importance of human milk and breastfeeding in the programming of infant health has risen to the fore. Anchoring of infant feeding in the developmental origins of health and disease has led to a resurgence of research focused in this area. Milk composition is highly variable both between and within mothers. Indeed the distinct maternal human milk signature, including its own microbiome, is influenced by environmental factors, such as diet, health, body composition and geographic residence. An understanding of these changes will lead to unravelling the adaptation of milk to the environment and its impact on the infant. In terms of the promotion of breastfeeding, health economics and epidemiology is instrumental in shaping public health policy and identifying barriers to breastfeeding. Further, basic research is imperative in order to design evidence-based interventions to improve both breastfeeding duration and women's breastfeeding experience.

This book discusses and assesses the latest trends in the interactive mobile field, and presents the outcomes of the 12th International Conference on Interactive Mobile Communication Technologies and Learning (IMCL2018), which was held in Hamilton, Canada on October 11 and 12, 2018. Today, interactive mobile technologies are at the core of many – if not all – fields of society. Not only does the younger generation of students expect a mobile working and learning environment, but also the new ideas, technologies and solutions coming out practically every day are further strengthening this trend. Since its inception in 2006, the conference has been devoted to highlighting new approaches in interactive mobile technologies with a focus on learning. The IMCL conferences have since established themselves as a valuable forum for exchanging and discussing new research results and relevant trends, as well as practical experience and best-practice examples. This book contains papers in the fields of: Interactive Collaborative Mobile Learning Environments Mobile Health Care Training Game-based Learning Design of Internet of Things (IoT) Devices and Applications Assessment and Quality in Mobile Learning. Its potential readership includes policymakers, educators and researchers in pedagogy and learning theory, schoolteachers, the learning industry, further education lecturers, etc.

Mechanics of Machines Oxford University Press, USA

This book contains selected and expanded contributions presented at the 15th Conference on Acoustics and Vibration of Mechanical Structures held in Timisoara, Romania, May 30-31, 2019. The conference focused on a broad range of topics related to acoustics and vibration, such as analytical approaches to nonlinear noise and vibration problems, environmental and occupational noise, structural vibration, biomechanics and bioacoustics, as well as experimental approaches to vibration problems in industrial processes. The different contributions also address the analytical, numerical and experimental techniques applicable to analyze linear and non-linear noise and vibration problems (including strong nonlinearity) and they are primarily intended to emphasize the actual trends and state-of-the-art developments in the above mentioned topics. The book is meant for academics, researchers and professionals, as well as PhD students concerned with various fields of acoustics and vibration of mechanical structures.

Grasping in Robotics contains original contributions in the field of grasping in robotics with a broad multidisciplinary approach. This gives the possibility of addressing all the major issues related to robotized grasping, including milestones in grasping through the centuries, mechanical design issues, control issues, modelling achievements and issues, formulations and software for simulation purposes, sensors and vision integration, applications in industrial field and non-conventional applications (including service robotics and agriculture). The contributors to this book are experts in their own diverse and wide ranging fields. This multidisciplinary approach can help make Grasping in Robotics of interest to a very wide audience. In particular, it can be a useful reference book for researchers, students and users in the wide field of grasping in robotics from many different disciplines including mechanical design, hardware design, control design, user interfaces, modelling, simulation, sensors and humanoid robotics. It could even be adopted as a reference textbook in specific PhD courses.

This work has been selected by scholars as being culturally important and is part of the knowledge base of civilization as we know it. This work is in the public domain in the United States of America, and possibly other nations. Within the United States, you may freely copy and distribute this work, as no entity (individual or corporate) has a copyright on the body of the work. Scholars believe, and we concur, that this work is important enough to be preserved, reproduced, and made generally available to the public. To ensure a quality reading experience, this work has been proofread and republished using a format that seamlessly blends the original graphical elements with text in an easy-to-read typeface. We appreciate your support of the preservation process, and thank you for being an important part of keeping this knowledge alive and relevant.

Mechatronics is a multidisciplinary branch of engineering combining mechanical, electrical and electronics, control and automation, and computer engineering fields. The main research task of mechatronics is design, control, and optimization of advanced devices, products, and hybrid systems utilizing the concepts found in all these fields. The purpose of this special issue is to help better understand how mechatronics will impact on the practice and research of developing advanced techniques to model, control, and optimize complex systems. The special issue presents recent advances in mechatronics and related technologies. The selected topics give an overview of the state of the art and present new research results and prospects for the future development of the interdisciplinary field of mechatronic systems.

The purpose of this book is to give a basic understanding of rotor dynamics phenomena with the help of simple rotor models and subsequently, the modern analysis methods for real life rotor systems. This background will be helpful in the identification of rotor-bearing system parameters and its use in futuristic model-based condition monitoring and, fault diagnostics and prognostics. The book starts with introductory material for finite element methods and moves to linear and non-linear vibrations, continuous systems, vibration measurement techniques, signal processing and error analysis, general identification techniques in engineering systems, and MATLAB analysis of simple rotors. Key Features: • Covers both transfer matrix methods (TMM) and finite element methods (FEM) • Discusses transverse and torsional vibrations • Includes worked examples with simplicity of mathematical background and a modern numerical method approach • Explores the concepts of instability analysis and dynamic balancing • Provides a basic understanding of rotor dynamics phenomena with the help of simple rotor models including modern analysis methods for real life rotor systems.

The 33 papers presented in this book were selected from amongst the 97 papers presented during the sixth edition of the International Conference on Integrated Design and Manufacturing in Mechanical Engineering during 28 sessions. This conference represents the state-of-the-art research in the field. Two keynote papers introduce the subject of the Conference and are followed by the different themes highlighted during the conference.

Wineries are facing new challenges due to actual market demands for the creation of products exhibiting more particular flavors. In addition, climate change has led to the requirement for grape varieties with specific features, such as convenient maturation times, enhanced tolerance towards dryness, osmotic stress, and resistance against plant-pathogens. The next generation of yeast starter cultures should produce wines with an appealing sensory profile and less alcohol. This Special Issue comprises actual studies addressing some of the problems and solutions for the environmental, technical, and consumer challenges of wine making today: Development of sophisticated mass spectroscopic methods enable the identification of the major metabolite spectrum of grapes/wine and deliver detailed insights in terroir and yeast-specific traits; Knowledge of the origin and reactions of reductive sulphur compounds facilitates the avoidance of unpleasant wine odors; Innovative physical–chemical treatments support effective and sustainable color extraction from red grape varieties; Enological enzymes from yeasts used directly or in the form of starter cultures are promising tools to increase the juice yields, color intensity, and aroma of wine; Natural and artificial *Saccharomyces* hybrids as well as collections of adapted wild isolates from various ecological niches will extend winemakers repertoire, allowing individual fermentations; Exact process control of wine fermentations by convenient computer programs will guarantee consistently high product quality.

This proceedings volume contains papers that have been selected after review for oral presentation at ROMANSY 2016, the 21th CISM-IFTToMM Symposium on Theory and Practice of Robots and Manipulators. These papers cover advances on several aspects of the wide field of Robotics as concerning Theory and Practice of Robots and Manipulators. ROMANSY 2016 is the 21st event in a series that started in 1973 as one of the first conference activities in the world on Robotics. The first event was held at CISM (International Centre for Mechanical Science) in Udine, Italy on 5-8 September 1973. It was also the first topic conference of IFTToMM (International Federation for the Promotion of Mechanism and Machine Science) and it was directed not only to the IFTToMM community.

The papers in this volume provide a vision of the evolution of the robotics disciplines and indicate new directions in which these disciplines are foreseen to develop. Paper topics include, but are not limited to, novel robot design and robot modules/components, service, education, medical, space, welfare and rescue robots, humanoid robots, bio-robotics, multi-robot, embodied multi-agent systems, challenges in control, modeling, kinematical and dynamical analysis of robotic systems, innovations in sensor systems for robots and perception, and recent advances in robotics. In particular, many contributions on humanoid robots from leading Japanese researchers are included.

This book presents the selected peer-reviewed proceedings of the International Conference on Innovative Engineering Design (ICOIED 2020). The contents provide a multidisciplinary approach for the development of innovative product design and their benefits for the society. The book presents latest advances in various fields like design process, service development, micro/nano technology, sensors and MEMS, and sustainability in engineering design. This book can be useful for students, researchers, and professionals interested in innovative product/process design and development.

Advances in Reconfigurable Mechanisms and Robots I provides a selection of key papers presented in The Second ASME/IFTToMM International Conference on Reconfigurable Mechanisms and Robots (ReMAR 2012) held on 9th -11th July 2012 in Tianjin, China. This ongoing series of conferences will be covered in this ongoing collection of books. A total of seventy-eight papers are divided into seven parts to cover the topology, kinematics and design of reconfigurable mechanisms with the reconfiguration theory, analysis and synthesis, and present the current research and development in the field of reconfigurable mechanisms including reconfigurable parallel mechanisms. In this aspect, the recent study and development of reconfigurable robots are further presented with the analysis and design and with their control and development. The bio-inspired mechanisms

and subsequent reconfiguration are explored in the challenging fields of rehabilitation and minimally invasive surgery. Advances in Reconfigurable Mechanisms and Robots I further extends the study to deployable mechanisms and foldable devices and introduces applications of reconfigurable mechanisms and robots. The rich-content of Advances in Reconfigurable Mechanisms and Robots I brings together new developments in reconfigurable mechanisms and robots and presents a new horizon for future development in the field of reconfigurable mechanisms and robots.

This book presents the select proceedings of the International Conference on Functional Material, Manufacturing and Performances (ICFMMP) 2019. The book covers broad aspects of several topics involved in the metrology and measurement of engineering surfaces and their implementation in automotive, bio-manufacturing, chemicals, electronics, energy, construction materials, and other engineering applications. The contents focus on cutting-edge instruments, methods and standards in the field of metrology and mechanical properties of advanced materials. Given the scope of the topics, this book can be useful for students, researchers and professionals interested in the measurement of surfaces, and the applications thereof.

Theory of Machines and Mechanisms, Third Edition, is a comprehensive study of rigid-body mechanical systems and provides background for continued study in stress, strength, fatigue, life, modes of failure, lubrication and other advanced aspects of the design of mechanical systems. This third edition provides the background, notation, and nomenclature essential for students to understand the various and independent technical approaches that exist in the field of mechanisms, kinematics, and dynamics of machines. The authors employ all methods of analysis and development, with balanced use of graphical and analytic methods. New material includes an introduction of kinematic coefficients, which clearly separates kinematic (geometric) effects from speed or dynamic dependence. At the suggestion of users, the authors have included no written computer programs, allowing professors and students to write their own and ensuring that the book does not become obsolete as computers and programming languages change. Part I introduces theory, nomenclature, notation, and methods of analysis. It describes all aspects of a mechanism (its nature, function, classification, and limitations) and covers kinematic analyses (position, velocity, and acceleration). Part II shows the engineering applications involved in the selection, specification, design, and sizing of mechanisms that accomplish specific motion objectives. It includes chapters on cam systems, gears, gear trains, synthesis of linkages, spatial mechanisms, and robotics. Part III presents the dynamics of machines and the consequences of the proposed mechanism design specifications. New dynamic devices whose functions cannot be explained or understood without dynamic analysis are included. This third edition incorporates entirely new chapters on the analysis and design of flywheels, governors, and gyroscopes.

This book covers a variety of topics in mechanics, with a special emphasis on material mechanics. It reports on fracture mechanics, fatigue of materials, stress-strain behaviours, as well as transferability problems and constraint effects in fracture mechanics. It covers different kind of materials, from metallic materials such as ferritic and austenitic steels, to composites, concrete, polymers and nanomaterials. Additional topics include heat transfer, quality control and reliability of structures and components. Furthermore, the book gives particular attention to new welding technologies such as STIR welding and spray metal coating, and to novel methods for quality control, such as Taguchi design, fault diagnosis and wavelet analysis. Based on the 2015 edition of the Algerian Congress of Mechanics (Congrès Algérien de Mécanique, CAM), the book also covers energetics, in terms of simulation of turbulent reactive flow, behaviour of supersonic jet, turbulent combustion, fire induced smoke layer, and heat and mass transfer, as well as important concepts related to human reliability and safety of components and structures. All in all, the book represents a complete, practice-oriented reference guide for both academic and professionals in the field of mechanics.

The author developed this text over many years, teaching graduate courses in advanced dynamics and flexible multibody dynamics at the Daniel Guggenheim School of Aerospace Engineering of the Georgia Institute of Technology. The book presents a unified treatment of rigid body dynamics, analytical dynamics, constrained dynamics, and flexible multibody dynamics. A comprehensive review of numerical tools used to enforce both holonomic and nonholonomic constraints is presented. Advanced topics such as Maggi's, index-1, null space, and Udwadia and Kalaba's formulations are presented because of their fundamental importance in multibody dynamics. Methodologies for the parameterization of rotation and motion are discussed and contrasted. Geometrically exact beams and shells formulations, which have become the standard in flexible multibody dynamics, are presented and numerical aspects of their finite element implementation detailed. Methodologies for the direct solution of the index-3 differential-algebraic equations characteristic of constrained multibody systems are presented. It is shown that with the help of proper scaling procedures, such equations are not more difficult to integrate than ordinary differential equations. This book is illustrated with numerous examples and should prove valuable to both students and researchers in the fields of rigid and flexible multibody 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.

Kinematics, Dynamics, and Design of Machinery, Third Edition, presents a fresh approach to kinematic design and analysis and is an ideal textbook for senior undergraduates and graduates in mechanical, automotive and production engineering Presents the traditional approach to the design and analysis of kinematic problems and shows how GCP can be used to solve the same problems more simply Provides a new and simpler approach to cam design Includes an increased number of exercise problems Accompanied by a website hosting a solutions manual, teaching slides and MATLAB® programs

Pearson introduces yet another textbook from Professor R. C. Hibbeler - Fluid Mechanics in SI Units - which continues the author's commitment to empower students to master the subject.

Human beings, regardless of age, sex, or state of health, are designed by evolution to form meaningful interpersonal relationships through verbal and nonverbal communication. The theme that empathic human connections are beneficial to the body and mind underlies all 12 chapters of this book, in which empathy is viewed from a multidisciplinary perspective that includes evolutionary biology; neuropsychology; clinical, social, developmental, and educational psychology; and health care delivery and education.

Mechanics of Machines is designed for undergraduate courses in kinematics and dynamics of machines. It covers the basic concepts of gears, gear trains, the mechanics of rigid bodies, and graphical and analytical kinematic analyses of planar mechanisms. In addition, the text

describes a procedure for designing disc cam mechanisms, discusses graphical and analytical force analyses and balancing of planar mechanisms, and illustrates common methods for the synthesis of mechanisms. Each chapter concludes with a selection of problems of varying length and difficulty. SI Units and US Customary Units are employed. An appendix presents twenty-six design projects based on practical, real-world engineering situations. These may be ideally solved using Working Model software.

p.p1 {margin: 0.0px 0.0px 0.0px 0.0px; font: 10.0px Arial} The right of copyright owners to make their content available to the public is crucial in an environment driven by access. The Making Available Right provides in-depth analysis of this exclusive right and offers insights on how we can approach the right in a more transparent and principled manner. This thought-provoking book brings together detailed analysis of the law and a broader consideration of copyright's fundamental aims, and will be of interest to judges, practitioners and scholars concerned about how copyright deals with access going forward.

"Emphasizes the industrial relevance of the subject matter, dispenses with conventional inaccurate graphical methods used in Kinematics of plane mechanisms, cams and balancing. Instead presents general vector approach for both plane and space mechanisms."--BOOK JACKET. STEEL DESIGN covers the fundamentals of structural steel design with an emphasis on the design of members and their connections, rather than the integrated design of buildings. The book is designed so that instructors can easily teach LRFD, ASD, or both, time-permitting. The application of fundamental principles is encouraged for design procedures as well as for practical design, but a theoretical approach is also provided to enhance student development. While the book is intended for junior-and senior-level engineering students, some of the later chapters can be used in graduate courses and practicing engineers will find this text to be an essential reference tool for reviewing current practices. Important Notice: Media content referenced within the product description or the product text may not be available in the ebook version.

This book presents a systematic design methodology for decoding the interior structure of the Antikythera mechanism, an astronomical device from ancient Greece. The historical background, surviving evidence and reconstructions of the mechanism are introduced, and the historical development of astronomical achievements and various astronomical instruments are investigated. Pursuing an approach based on the conceptual design of modern mechanisms and bearing in mind the standards of science and technology at the time, all feasible designs of the six lost/incomplete/unclear subsystems are synthesized as illustrated examples, and 48 feasible designs of the complete interior structure are presented. This approach provides not only a logical tool for applying modern mechanical engineering knowledge to the reconstruction of the Antikythera mechanism, but also an innovative research direction for identifying the original structures of the mechanism in the future. In short, the book offers valuable new insights for all readers who are interested in the Antikythera mechanism.

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.

Newton genealogy, genealogical, biographical, historical being a record of the descendants of Richard Newton of Sudbury and Marlborough, Massachusetts 1638, with genealogies of families descended from the immigrants, Rev. Roger Newton of Milford, Connecticut; Thomas Newton of Fairfield, Connecticut; Matthew Newton of Stonington, Connecticut; Newtons of Virginia; Newtons near Boston.

The articles of this book were reported and discussed at the fifth international symposium on Advances in Robot Kinematics. As is known, the first symposium of this series was organised in 1988 in Ljubljana. The following meetings took place every other year in Austria, Italy, and Slovenia (Linz, Ferrara, Ljubljana, Portoroz Bernardin). It must be emphasised that the symposia run under the patronage of the International Federation for the Theory of Machines and Mechanisms, IFToMM. In this period, Advances in Robot Kinematics has been able to attract the most outstanding authors in the area and also to create an optimum combination of a scientific pragmatism and a friendly atmosphere. Hence, it has managed to survive in a strong competition of many international conferences and meetings. In the most ancient way, robot kinematics is regarded as an application of the kinematics of rigid bodies. However, there are topics and problems that are typical for robot kinematics that cannot easily be found in any other scientific field. It is our belief that the initiative of Advances in Robot Kinematics has contributed to develop a remarkable scientific community. The present book is of interest to researchers, doctoral students and teachers, engineers and mathematicians specialising in kinematics of robots and mechanisms, mathematical modelling, simulation, design, and control of robots.

Mechanics of Mechanisms and Machines provides a practical approach to machine statics, kinematics, and dynamics for undergraduate and graduate students and mechanical engineers. The text uses a novel method for computation of mechanism and robot joint positions, velocities, accelerations; and dynamics and statics using matrices, graphs, and generation of independent equations from a matroid form. The computational methods presented can be used for industrial and commercial robotics applications where accurate and quick mechanism/robot control is key. The book includes many examples of linkages, cams, and geared mechanisms, both planar and spatial types, having open or multiple cycles. Features • Presents real-world examples to help in the design process of planar and spatial mechanisms • Serves as a practical guide for the design of new products using mechanical motion analysis • Analyzes many applications for gear trains and auto transmissions, robotics and manipulation, and the emerging field of biomechanics • Presents novel matrix computational methods, ideal for the development of efficient computer implementations of algorithms for control or simulation of mechanical linkages, cams, and geared mechanisms • Includes mechanism animations and result data tables as well as comparisons between matrix-based equation results implemented using Engineering Equation Solver (EES) and results for the same mechanisms simulated using SolidWorks. For full market implementation of PEM fuel cells to become a reality, two main limiting technical issues must be overcome- cost and durability. This cutting-edge volume directly addresses the state-of-the-art advances in durability within every fuel cell stack component. [...] chapters on durability in the individual fuel cell components -- membranes, electrodes, diffusion media, and bipolar plates -- highlight specific degradation modes and mitigation strategies. The book also includes chapters which synthesize the component-related failure modes to examine experimental diagnostics, computational modeling, and laboratory protocol"--Back cover.

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