



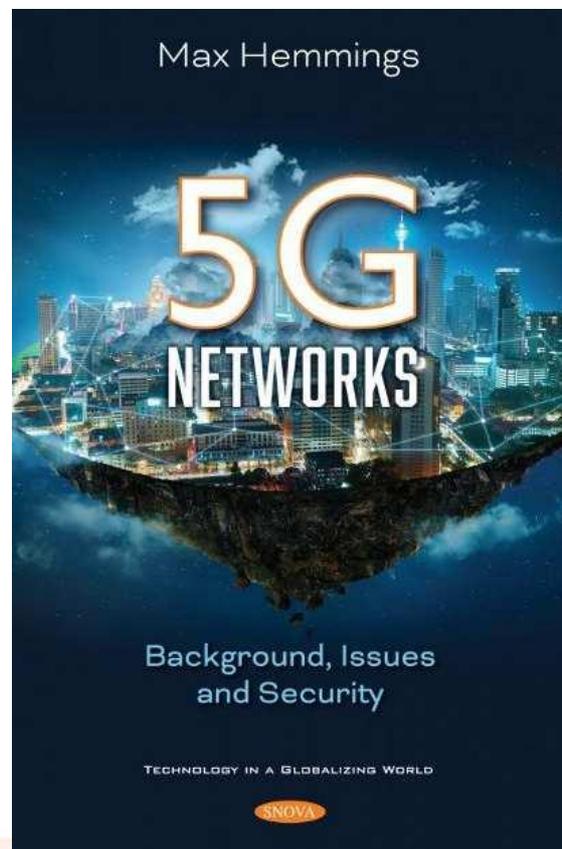
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ENGINEERING STUDIES

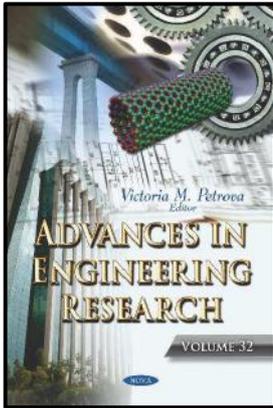


TITLES PUBLISHED BY NOVA SCIENCE

- Advances in Engineering Research
- Advances in Materials Science Research
- Advances in Nanotechnology
- Computer Science, Technology & Applications
- Construction Materials & Engineering
- Education in a Competitive & Globalizing World
- Electrical Engineering Developments
- Electronics & Telecommunications Research
- Materials Science & Technologies
- Mechanical Engineering Theory & Applications
- Nanotechnology Science & Technology
- Polymer Science & Technology
- Robotics Research & Technology
- Safety & Risk in Society
- Systems Engineering Methods, Developments & Technology
- Technology in a Globalizing World

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Advances in Engineering Research

Edited by Victoria M. Petrova

Advances in Engineering Research. Volume 32 opens by describing a general strategy for building Markov chain models and performing computational analysis of characteristics of the process, as well as showing a few examples of applying this approach to modeling mixing, grinding, fluidized bed, etc.

Next, the configurations of gas channels and gas diffusion layers influences on the performance of polymer electrolyte membrane fuel cells are investigated.

Additionally, a numerical method and an experimental method are realized to predict aeroelastic response and characteristic parameters of wing structure. The numerical method is based on coupled algorithms between computational fluid dynamics and computational structural dynamics.

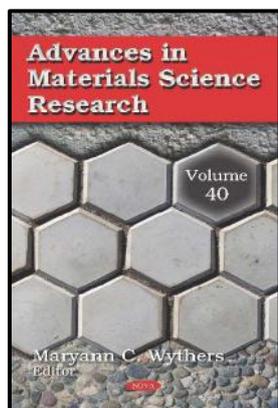
A Lagrangian expression based on the state equation of a class of nonlinear system is proposed to develop the corresponding functional. From this, a control law is developed, and by employing the classical Euler-Lagrange approach, the operation of the system was led to a critical point with success.

Following this, a roadmap is presented to directly transition from cutting edge experimental and in-situ geospatial data-collection technology to a predictive computational model for volcanic lahars.

The soil-pile-structure interaction plays an important role in assessing the vibrations internally generated within structures due to dynamic loads that could bring significant impacts on the structural behavior. As such, the effects of forces on the seismic response of three tall and massive building cases are investigated.

In conclusion, research is presented on the joint effect of silica fume and nanosilica on the fresh and hardened properties of natural hydraulic lime-based grouts for mechanical strengthening of old stone masonry walls.

Volume 32 - HB 9781536166842 £229.99 February 2020 Nova Science Publishers 260 pages
Volume 33 - HB 9781536170023 £229.99 March 2020 Nova Science Publishers 237 pages
Volume 34 - HB 9781536176179 £229.99 April 2020 Nova Science Publishers 279 pages
Volume 35 - HB 9781536178517 £229.99 June 2020 Nova Science Publishers 214 pages
Volume 36 - HB 9781536181050 £229.99 July 2020 Nova Science Publishers 260 pages
Volume 37 - HB 9781536183092 £229.99 September 2020 Nova Science Publishers 225 pages
Volume 38 - HB 9781536185089 £229.99 October 2020 Nova Science Publishers 276 pages
Volume 39 - HB 9781536187144 £229.99 December 2020 Nova Science Publishers 249 pages
Volume 40 - HB 9781536187540 £229.99 December 2020 Nova Science Publishers 227 pages
Volume 41 - HB 9781536188820 £229.99 December 2020 Nova Science Publishers 262 pages



Advances in Materials Science Research

Edited by Maryann C. Wythers

Advances in Materials Science Research. Volume 40 first summarizes the recently published literature regarding modern applications of lignocellulosic materials. Lignocellulosic materials were conventionally treated as wastes for disposal, but are gaining recognition for their role in the supply of renewable resources.

The authors discuss in detail the material attributes of pullulan and their correlation with the quality attributes of finished formulation, including: assay, dissolution, related substances and content uniformity.

Additionally, this compilation presents the development of a dip-coating instrument and its applications in the thin film deposition of colloidal nanocrystals. The instrument was based on an Arduino microcontroller, a stepper motor and a mechanical structure using a belt and pulley connection from motor to substrate holder.

Silicone oil emulsions stabilized by various emulsifiers, such as surfactants, polymers, and solid particles (with and without pre-adsorbed surfactants or polymers) are also reviewed. Emulsion stability, interfacial properties, and rheological properties as a function of the emulsifier concentration in the complete emulsification of silicone oil are discussed.

Next, the wet-chemical method was used to prepare various ZnO coated carbon nanotube nanocomposites, ZnO coated carbon black, ZnO coated graphene oxide, and ZnO nanoparticles in higher pH mediums. This approach was used to detect and quantify the xanthine in real samples.

The concluding chapter highlights the results of studies on structure transformations in amorphous Fe-based alloys induced by laser irradiation, the kinetics and mechanisms of structure phase transitions, and the irradiation influence on magnetic and mechanical properties of the alloy.

Volume 40 - HB 9781536171457 £229.99 February 2020 Nova Science Publishers 258 pages

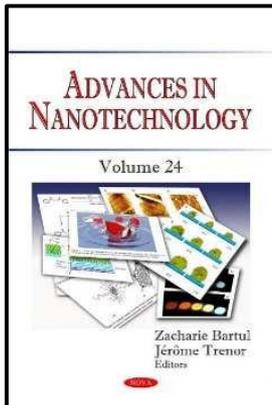
Volume 41 - HB 9781536177855 £229.99 June 2020 Nova Science Publishers 244 pages

Volume 42 - HB 9781536184419 £229.99 September 2020 Nova Science Publishers 223 pages

Volume 43 - HB 9781536187168 £229.99 October 2020 Nova Science Publishers 225 pages

Volume 44 - HB 9781536190281 £229.99 January 2021 Nova Science Publishers 221 pages

Advances in Nanotechnology



Advances in Nanotechnology

Volume 24

Edited by Zacharie Bartul

Advances in Nanotechnology. Volume 24 introduces the basic principle of resonance energy transfer, discussing the resonance energy transfer process involved in plasma noble metallic nanoparticles on the basis of new research.

The authors discuss the principles and the mechanisms of Magnetofection™ and illustrate it by using multiple examples of its applications in viral and non-viral nucleic acid delivery, both in vitro and in vivo.

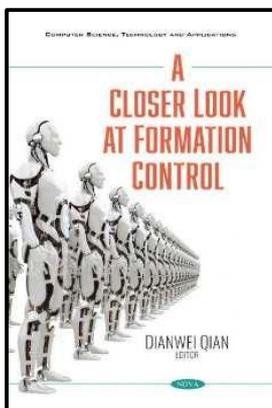
In one study, polyvinyl chloride is prepared with the percentages 30 wt.% PVC (30 wt%) loaded with 3-8 wt.% of titanium oxide nanoparticles, and the performance of prepared membranes is calculated.

Recent progress on the synthesis of amphiphilic and stimuli responsive block copolymers by Reversible Addition-Fragmentation chain Transfer polymerization polymerization is assessed, with special focus on triblock terpolymers.

The applications of Pluronic micelles in drug solubilization and delivery are explored for a better understanding of the importance of these materials in pharmaceutical applications. Later, the characteristics and transfer functions of the electroelastic digital-to-analog converter actuator for nanotechnology are examined. In closing, the authors review the magnetic and electric properties of different systems made up of the so-obtained Ni nanowires.

HB 9781536184600 £229.99 September 2020 Nova Science Publishers 273 pages

Computer Science, Technology & Applications



A Closer Look at Formation Control

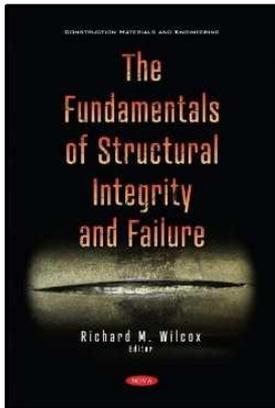
Edited by Dianwei Qian

Formation control is one of the most challenging problems in cooperative multi-robots. It is defined as a coordination of a group of robots to get into and to maintain a formation with a certain shape. The formation control problem has drawn significant attention for many years, and now it is well understood and tends to be mature. This control problem is originated from biological inspires such as flocking and schooling.

Its classification includes formation shape generation, formation reconfiguration and selection, formation tracking, and role assignment in formation. It also has potential applications in search and rescue missions, forest fire detection and surveillance, etc. It can be extended to many real world systems, autonomous robots, such as underwater vehicles, unmanned aerial vehicles, mobile sensor networks, rectangular agents, nonholonomic mobile robots, to name but a few.

Apparently, the book cannot include all research topics. The editor and the authors wish that it could reveal some tendencies on this research field and benefit readers. In this book, different aspects of formation control are explored. Chapters includes some new tendencies and developments in research on several formation methods of multi-robot systems, that is, the 1st-order sliding mode control, the 2nd-order sliding mode control, the integral sliding mode control, the terminal sliding mode control, the sliding model control of multi-agents and the fuzzy-based formation control of multiple quadrotor systems.

HB 9781536181777 £146.99 August 2020 Nova Science Publishers 224 pages



The Fundamentals of Structural Integrity and Failure

Edited by Richard M. Wilcox

The Fundamentals of Structural Integrity and Failure provides a comprehensive review of spent nuclear fuel integrity and the research work which has been carried out in the important area of spent nuclear fuel integrity management.

Additionally, the authors review the key aspects of fatigue crack nucleation and the fracture mechanics of short- and long-crack growth, with emphasis on achieving total fatigue life prediction.

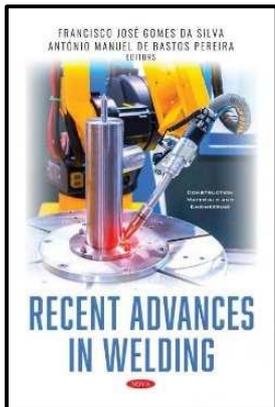
The fundamental aspects of mathematical modeling, computation, measurement, and signal processing involved in the process of integrity assessment of engineering structures in the presence of uncertainty are presented.

Following this, several proposed techniques for the detection of the defects in ferromagnetic steel components are analyzed. One of these possible approaches is based on the additional magnetization of the inspected zone to minimize magnetic heterogeneity, and another trend is concerned with new selective Eddy current probe development.

The capabilities of nondestructive testing techniques based on coercive force measurements concerned with several new applications are discussed.

This concluding work demonstrates the use of a judicious and effective method for detecting pressure vessel failures, applying Wiener filter concepts to noisy signals.

HB 9781536187786 £178.99 November 2020 Nova Science Publishers 251 pages



Recent Advances in Welding

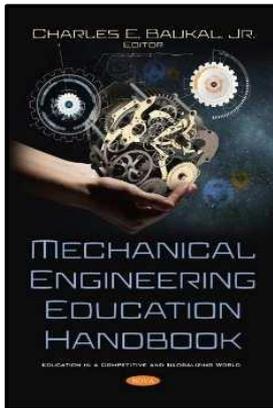
Edited by Francisco José Gomes da Silva

Welding is a conventional joining process that has followed the recent developments in other manufacturing processes, continuing to be an extremely used and investigated process. Several technologies developed in other areas of knowledge have converged in the area of welding, allowing significant improvements in the quality of the products obtained and in the increased productivity of the processes. Although some techniques have been implemented and studied for several decades, the interest of researchers in welding has not diminished, as it can be seen through new processes that have emerged, such as Friction Stir Welding, in addition to many other notable developments in welding processes which apparently seemed to have reached their final stage of maturity.

This work brings together a set of very interesting works, being a living proof that welding continues to be heavily investigated and that the developments around this manufacturing process are constantly emerging. Because the materials continue to evolve and the technology around welding also continues to develop at a very good pace, studies on the weldability of new materials and the application of new techniques and technologies to already well known welding processes does not stop happening.

The editors are proud to have collected this set of works that can help scholars and researchers to broaden their knowledge in the field of welding, thus contributing to the creation of a knowledge base that allows researchers to start new investigations and achievements in the coming decades.

HB 9781536183429 £211.99 October 2020 Nova Science Publishers 356 pages



Mechanical Engineering Education Handbook

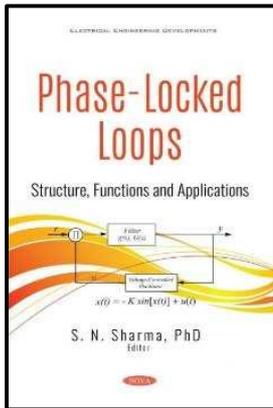
Charles E. Baukal, Jr.

This book is believed to be the first to specifically address mechanical engineering education. It is divided into three sections: pedagogy, curriculum, and future. The pedagogy section contains seven chapters on various aspects of enhancing student learning. Chapter one concerns research regarding mechanical engineering (ME) students' learning preferences. ME students are much more visual and prefer more problem solving compared to the general population. Chapter two is on leveraging technology to elevate pedagogy. The authors show many different ways of using technologies, such as the use of iMovie and Doceri, to enhance the practice of teaching. Chapter three on mastery-based learning concerns assessing students on what skills they can do well rather than almost solely on how well they do on exams. Chapter four discusses how team-based assignments can be used to meet multiple student outcomes. Examples are given for a fluid mechanics lab and a thermodynamics class. Chapter five describes how team-based active learning can be used to expose students to the aerospace design process and industry practices. Chapter six shows how a problem-based learning approach was converted to an entrepreneurially minded learning approach in a mechatronics design course. The application of the Kern Entrepreneurial Engineering Network (KEEN) framework showed a significant increase in the students' entrepreneurial mindset. Chapter seven recommends the inclusion of open-ended problems in courses at all levels to help prepare students for real-world problems, which often have multiple possible correct solutions.

Section two on curriculum has five chapters more specifically on ME courses and programs. Chapter eight advocates incorporating more hands-on design into the ME curriculum because of its importance in practice. Chapter nine shows an example of how an entrepreneurial mindset can be fostered and developed in an engineering experimentation course. Chapter ten demonstrates how research has shown that replacing thermodynamic tables, which students often struggle to use, with thermodynamic property charts can help students form better mental models. Chapter eleven discusses the use of active learning techniques to more effectively incorporate the teaching of materials in the ME curriculum. Chapter twelve considers how reverse engineering can be incorporated into the ME curriculum. While original design is incorporated into the ME curriculum, reverse engineering of existing designs can be a valuable addition that can help prepare MEs for professional practice.

Section three has two chapters related to the future. Chapter thirteen discusses how ME students can be more effectively prepared for their future in the industry, not so much by changing the curriculum, but by changing the teaching approach. Some examples include less theory and more practice, improved problem solving and simulating the industrial work environment. The authors include those who work or have worked full time in industry and work part time or full time in academia, as well as two relatively recent ME graduates. The last chapter discusses possible future areas of research for improving mechanical engineering education. Those areas include, for example, improved course content, curriculum, communication, assessment, virtual reality, codes and standards, multimedia and innovation/entrepreneurship.

HB 9781536177916 £211.99 May 2020 Nova Science Publishers 488 pages



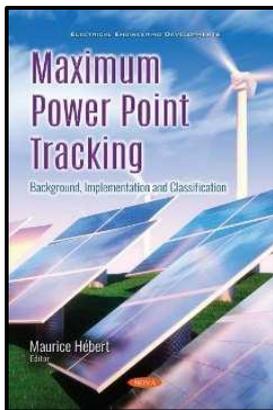
Phase-Locked Loops Structure, Functions and Applications

Edited by Shambhu N. Sharma

The historic account of the Phase-Locked Loops can be traced back from the idea of designing an electromechanical system with the objective of controlling the oscillation of the pendulum of the bell Great George. The method is to contrast the phase of pendulum and the incoming telegraph signal phase using the electromechanical system. That generates the correction signal varying the pendulum oscillation. The idea was conceived as well as implemented by David Robertson, Professor of Electrical Engineering at the University of Bristol.

The term Phase-Locked Loop was coined to this technique by later Researchers in 1932. Professor David Robertson is credited to the Phase-Locked Loop for pioneering the technique. In general setting, the Phase-Locked Loops are for synchronization purposes. The phase locked loops perspective hinges on the analysis, functions and applications.

HB 9781536183382 £211.99 September 2020 Nova Science Publishers 324 pages



Maximum Power Point Tracking Background, Implementation and Classification

Edited by Maurice Hébert

Maximum Power Point Tracking: Background, Implementation and Classification presents state-of-art of existing conventional maximum power point techniques, along with shading mitigation techniques, and compares them on various parameters.

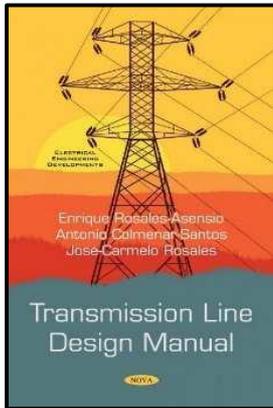
Photovoltaic systems include storage batteries when there is surplus power to provide electricity on demand. A suitable charge controller is needed for interfacing the solar photovoltaic module(s) with the battery bank. As such, attention has been made to attribute more features to the controller which will enhance the efficiency and controllability, and to monitor the health of the battery being charged.

The authors review the considerations for maximum power point tracking in large utility scale photovoltaic systems and small-scale residential photovoltaic systems. A set of characteristics is proposed and criteria is defined to evaluate the suitability of a technique.

In the penultimate study, power storage systems in ~100 W level are developed, which consist of direct current-alternating current converters, spherical Si solar cells, a maximum power point tracking controller, and lithium-ion batteries. Two types of inverters were used: SiC metal-oxide-semiconductor field-effect transistors (MOSFETs) and conventional Si MOSFETs.

In closing, the authors propose a simplified control stratagem to offer optimal power output power from a variable speed grid connected wind energy conversion system.

PB 9781536181647 £87.99 August 2020 Nova Science Publishers 189 pages

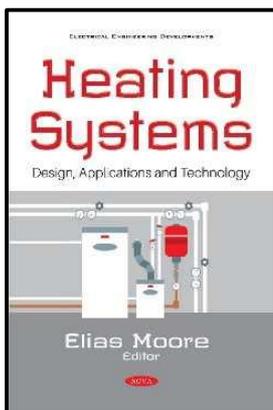


Transmission Line Design Manual

Antonio Colmenar-Santos

This book covers structural and foundation systems used in high-voltage transmission lines, conductors, insulators, hardware and component assembly. Furthermore, this text provides the essential fundamentals of transmission line design. It is a good blend of fundamental theory with practical design guidelines for overhead transmission lines, providing the basic groundwork for students as well as practicing power engineers, with material generally not found in one convenient book. Featuring design problems with solutions for students, the book is aimed at students, practicing engineers, researchers and academics. It contains beneficial information for those involved in the design and maintenance of transmission line structures and foundations. For those in academia, it will be an adequate text-book/design guide for graduate-level courses on the topic. Engineers and managers at utilities and electrical corporations will find the book to be a useful reference at work. This book presents the current state of electrical technology applied to the calculation and design of high voltage power lines, both aerial and underground, by means of an original approach based on the simple exposure of theoretical bases that allow the reader to apply them in the subsequent resolution of numerous real engineering examples. The examples in each chapter are developed in detail and have been selected in order to address the diversity of electrical and mechanical calculations required by the design of high voltage power lines. The book consists of chapters dedicated to the electrical design of lines, mechanical calculation of conductors, supports and foundations, design of grounding facilities and calculation of underground lines. There is no other book that gathers, in such a detailed way and with a focus eminently practical, all aspects related to the design of high voltage lines.

HB 9781536178555 £211.99 July 2020 Nova Science Publishers 359 pages



Heating Systems

Design, Applications and Technology

Edited by Elias Moore

Heating Systems: Design, Applications and Technology first discusses the development of different types of district heating systems, highlighting the main features of low temperature district heating and discussing its potential for supplying decarbonised heat.

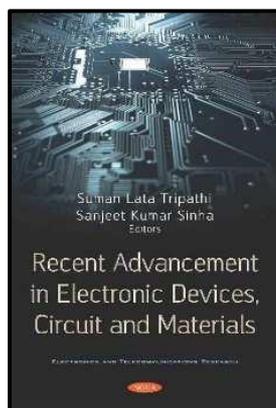
As buildings consume about 40% of the world's annual energy consumption globally, the authors focus on the evaluation of residential heating system alternatives using fuzzy numbers. Multi-criteria decision making techniques, fuzzy AHP and fuzzy ANP methods are used for evaluation and the results of both algorithms are compared.

Research is presented which is aimed at designing a logistics system for X Gas Company to ensure efficient distribution of liquefied petroleum gas, which begins with the ordering process and ends with the placement of stations in Istanbul-Turkey, taking into account the storage, preparation, loading and delivery operations of X Gas Company.

In closing, three types of electro heating skin-systems are presented and the main features of skin heating systems are considered. The advantages of these systems for heating extra-long pipelines transporting oil, gas, water and other liquids are explored.

PB 9781536175578 £75.99 March 2020 Nova Science Publishers 126 pages

Electronics & Telecommunications Research



Recent Advancement in Electronic Devices, Circuit and Materials

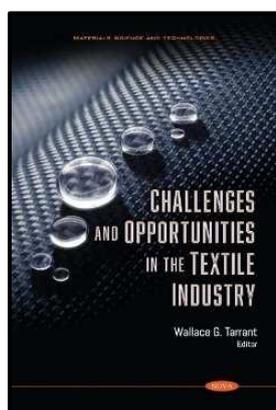
Edited by Suman Lata Tripathi

This book deals with some emerging semiconductor devices and their applications in terms of electronic circuits. The basic concept plays a key role in development of any new electronic devices and circuits. The implementation of complex integrated circuits becomes easier with understanding of basic concepts of solid state devices and its circuit behavior. The book covers the latest trends in development of advanced electronic devices and applications for undergraduate, graduate and post graduate level courses. It combines the right blend of theory and practice to present a simplified and methodical way to develop researchers' understanding of the clarity between theoretical, practical and simulated results in the analysis of solid state devices, circuit characteristics and other important issues based on their applications. The book also covers the broad applications of electronic devices in biomedical and low power portable smart IOT systems.

This book is well organized into 13 chapters. Chapters 1 to 4 cover design of low power FET devices compatible to technology scaling trends meeting required performance enhancement in terms of power, delay and speed. Chapter 5 and 6 are focused on analog application of CMOS technology. Chapter 7 describes power MOSFET design with advance materials for lowest possible on-resistance resulting into enhance performance. Chapter 8 deals with biomedical application of advance electronic devices introducing new materials and structure. Chapter 9 introduces a neuromorphic model and real-time simulation for the study of biological neuron model in the human body on circuit level. Chapter 10 and 11 presents the applications of sensors growing over a wide range of sensing targets along with advance sensing technology for human-computer interaction. Chapter 12 and 13 describe optoelectronic devices like photodetectors, optical sensors and solar cells etc.

PB 9781536165562 £211.99 February 2020 Nova Science Publishers 310 pages

Materials Science & Technologies



Challenges and Opportunities in the Textile Industry

Edited by Wallace G. Tarrant

This compilation presents a detailed review of current research, developments, and progress on nanotechnology usage for the elimination of dyes from effluents released by textile industries.

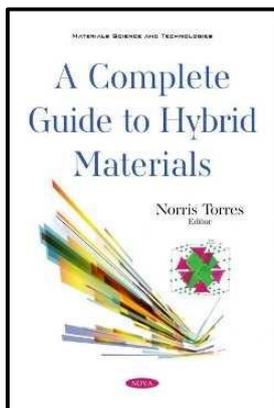
The benefits of using nanomaterials for functionalized textile production are presented, and the applications of nanomaterials in the most known functional technical textiles are discussed.

The authors present the results of empirical studies carried out in the Portuguese industrial context, including the textile sector, where the relationship between negative effects associated with shift work and the adoption of certain management practices by organizations is analyzed.

Additionally, the authors discuss how, to achieve the Fourth Industrial Revolution, technological tools must be incorporated into both the production and consumption of textiles.

The closing study indicates that it is possible to make objective pilling detection easily for standard fabric structures in the textile industry using databases created by measuring lots of samples.

PB 9781536187700 £87.99 October 2020 Nova Science Publishers 152 pages



A Complete Guide to Hybrid Materials

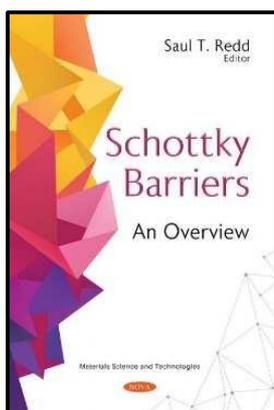
Edited by Norris Torres

A Complete Guide to Hybrid Materials opens with a study wherein the casting method is used to incorporate hybrid materials based on layered zinc hydroxide salts and phenolic compounds into the polymer matrix of polyvinyl alcohol to form composite films.

The authors review recent advances in the preparation and applications of inorganic nanoparticle molecularly imprinted polymers. Due to the specific binding sites, the result exhibits good selectivity, reproducibility, high binding capacity and fast kinetics for the rebinding of the analyte.

The closing chapter focuses on the formation of nano clay, an exfoliated clay, and proper dispersion in a polymer matrix.

PB 9781536188202 £75.99 November 2020 Nova Science Publishers 125 pages



Schottky Barriers

An Overview

Edited by Saul T. Redd

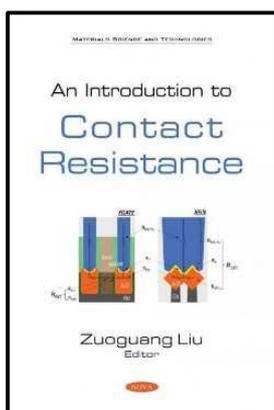
A Schottky barrier is an electrostatic interface between a metal and a semiconductor that plays a vital role in many electronic devices. Schottky Barriers: An Overview opens with a brief review of the metal-semiconductor Schottky junction, the basic charge transport theory and the issues associated with these barriers.

Additionally, the authors provide an overview of recent developments in the field of Schottky contacts to ZnO and related materials, such as ZnMgO, BeZnO, and BeMgZnO.

Despite the fundamental importance of Schottky barrier height, the mechanisms which control the barrier formation are still far from understood. As such, for a better understanding of Schottky barriers and barrier height, the authors discuss various empirical models.

In closing, AlGaIn/GaN Schottky barrier diodes with and without in-situ silicon carbon nitride cap layers are investigated, with the fabricated SBD with a SiCN cap layer exhibiting improved electrical characteristics.

PB 9781536186819 £87.99 November 2020 Nova Science Publishers 186 pages

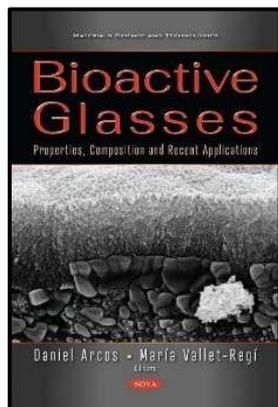


An Introduction to Contact Resistance

Edited by Zuoguang Liu

Contact resistance is both an old and new topic. It is old because fundamentals of the semiconductor-metal contacts were established in the 1930s even earlier than the study on Metal-Oxide-Semiconductor Field-Effect Transistor (MOSFET). The new knowledge is on material and integration aspects for contact resistance reduction. As the MOSFETs become smaller and smaller, device parasitics start to dominate performance since the 2010s. The resistance part in MOSFET RC delay is mainly from external parasitics particularly the contact resistance. In the past decade, 3D MOSFETs, also named FinFETs, became the device structure in leading semiconductor technology. The 3D structure brings a unique opportunity for engineering the contact resistance. In physics, this book introduces MOSFET device electronics and contact physics. In material science, a variety of contact metals and silicides are covered. In electrical characterization, test structures and measurements of contact resistance are discussed in depth. In technology, state-of-the-art process techniques, material engineering, and integration for contact resistance reduction are introduced. This book can serve as a reference book for students in electrical engineering and material science major and professionals in semiconductor industry.

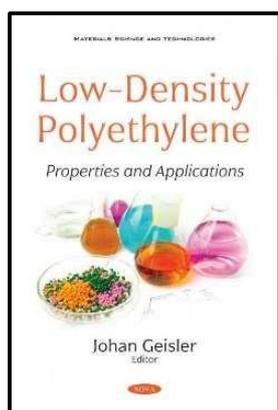
PB 9781536185010 £87.99 October 2020 Nova Science Publishers 164 pages



Bioactive Glasses **Properties, Composition and Recent Applications** Edited by Daniel Arcos

More than 50 years have passed since Professor Larry L. Hench discovered Bioglass. However bioactive glasses still awake the fascination of scientists, lecturers, students, dentists, orthopedic surgeons, etc. all over the world. The research developed during the subsequent decades has resulted in new materials that significantly differ from the original melt-derived Bioglass. The use of the sol-gel process in the 1990's and the discovery of mesoporous bioactive glasses in the 2000's revealed new potential applications in the field of bone regeneration and drug delivery platforms. Besides, the development of rapid prototyping techniques has allowed manufacturing bioglass-based 3D scaffolds in combination with polymers, which boosts the long-standing expectative of using bioactive glasses for the treatment of critical bone defects. Finally, the advances in nanomedicine have opened new research lines involving the synthesis and development of bioactive glass nanoparticles. "Bioactive Glasses: Properties, Composition and Recent Applications" consists of ten chapters written by worldwide recognized experts in this field. The book covers the most important topics in the field of bioactive glasses, from its discovering to the most recent advances in preparation methods and applications. This book is addressed to researchers involved in the field of bioceramics, but it also an excellent tool for undergraduate and PhD students, given that nowadays Biomaterials Science is a subject included in the program of many universities. Only knowing the discoveries that fifty years ago fascinated us, our students will understand the current efforts to expand the applications of bioactive glasses.

HB 9781536183375 £211.99 September 2020 Nova Science Publishers 379 pages



Low-Density Polyethylene **Properties and Applications** Edited by Johan Geisler

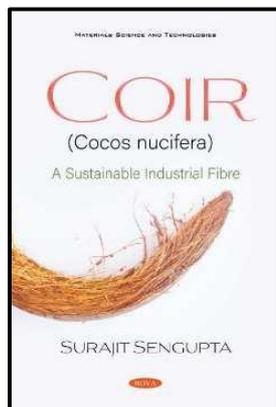
Low-Density Polyethylene: Properties and Applications examines the rheology of low-density Ppoly(ethylene)-based systems. Processing this commodity, alone or in combination with different micro/nano-fillers, requires a deep knowledge of its rheological behavior in order to set up the process parameters.

Following this, the comprehensive research progress on low-density polyethylene is reviewed, and the mechanisms of low-density polyethylene biodegradation are summarized. Additionally, the effect of microorganisms on low-density polyethylene and products of this degradation with their level of toxicity is discussed.

Later, the authors focus on the different types of low-density polyethylene, microorganism-mediated degradation, changes in the physiological properties of low-density polyethylene post degradation and its applications in other fields.

The detailed knowledge of preferential sorption is studied in an effort to reveal new information regarding low-density polyethylene properties. Consequently, the usage of low-density polyethylene in membrane separations is promoted.

PB 9781536181920 £75.99 August 2020 Nova Science Publishers 155 pages



Coir (Cocos nucifera) **A Sustainable Industrial Fibre** Edited by Surajit Sengupta

This monograph is intended to present an overview- most of which is based on ideas and conclusions presented in published literature, the rest representing our own concepts developed through extensive research. Here, the reader will discover the rational relationships between basic mechanisms, and experimental data, and theoretical expressions which were developed over several years by scientists for coir fibre characterisation and utilisation in particular. It will help to those who deal with coir fibre in both industry and academia specially to teachers, students and technologists. It contains the perspective of coir, its textile related structure and properties with a comparison between few other allied lingo-cellulosic fibres.

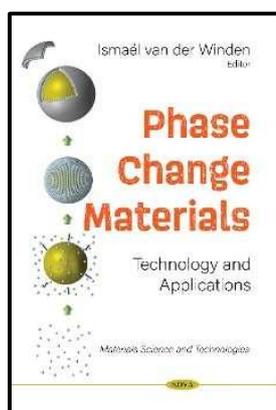
Coir fibre are coarser for textile applications and possesses highly variable properties. So segregation of fibres from the bulk considering properties may give suitable fibre for spinning, composite making and other applications. The optimum value addition of coir can be realized, when a fully systematic supply chain of quality fibre with proper gradation system can be developed.

The fibre shows high flexural rigidity and lower inter-fibre frictional resistance for which it is difficult to spin finer yarn and indicates its suitability for coarse textile applications. Coir fibre is circular and multi-fibrillar. Moisture regain is moderate. Thermal and component analyses reveal the presence of similar amount of lignin and celluloses in the fibre. SEM image reveals that surface of the fibre is waxy, irregular, and having micro-imperfections.

Microbial resistance makes the coir suitable for using it in different engineering and geotechnical applications in conjunction with soil and water. The property-based advantages of coir are resistant to fungi and rot, excellent insulation against temperature, not easily combustible, flame-retardant, resistant to moisture and dampness, tough and durable, highly resilient, totally static free, easy to clean etc. It is not suitable for technical uses due to low strength, high extensibility and very low modulus. Sometimes high bulk and low coefficient of friction act as the disadvantages. The age old manual spinning technology should be replaced by mechanised system.

The fibres can be highly suitable to form compressed mat for various products of geotextile, agro-textiles, and sound and heat insulators with improved softness and fineness property. Being an ecofriendly, natural product from renewable sources, coir products serve mankind in several ways as a substitute for many synthetic products which are extensively used but are harmful to nature. Coir wood substitute will help to protect valuable forests.

PB 9781536180596 £75.99 July 2020 Nova Science Publishers 137 pages



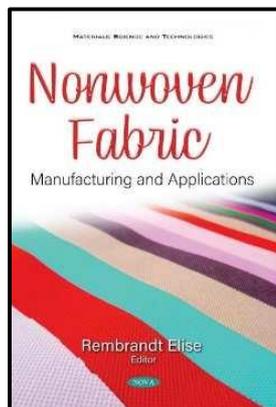
Phase Change Materials **Technology and Applications** Edited by Ismaël van der Winden

In this compilation, after considering solid-liquid transition, techniques required to obtain phase change materials are discussed. Various material combinations based on chemical and physical methods are also discussed, which are adopted to form solid-solid phase change.

Following this, a non-parity-time-symmetric three-layer structure is introduced, consisting of a gain medium layer sandwiched between two phase-change medium layers for switching the direction of reflectionless light propagation.

The concluding chapter discusses the effectiveness of phase change materials in building roofs for the reduction of energy consumption and the improvement of indoor comfort conditions.

PB 9781536175363 £87.99 March 2020 Nova Science Publishers 185 pages



Nonwoven Fabric Manufacturing and Applications

Edited by Rembrandt Elise

Nonwoven industry plays an important role in economy and society. Nonwoven Fabric: Manufacturing and Applications addresses important data on both natural and synthetic fibres that are used in the industry to develop products for different purposes.

Though synthetic fibres are extensively used in the nonwoven industry for the manufacture of various products, natural fibres are steadily occupying the market due to some of their obvious merits. In this respect, a review of the various manufacturing techniques for nonwoven fabric derived from natural fibres such as cotton, jute, flax and hemp is given in this book.

Next, the authors assess the structure, property, evaluation and applications of jute and jute blended needle-punched nonwoven fabric, in an effort to aid those who work with natural lingo-cellulosic fibre-based needle punched nonwovens.

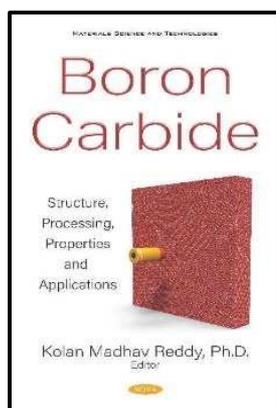
In addition, flax/low melting point polyester needle punched nonwoven fabrics were manufactured and characterized for thermal insulation applications. The test results show a decrease in thermal resistance value with an increase in low melt PET % and needle penetration depth.

Six types of recycled nonwovens samples were developed using thermal bonding and aero dynamic methods, and these samples are characterized by their physical properties such as areal density, bulk density, thickness, porosity, air permeability and thermal resistance.

The authors assess the way in which the increased use of fire retardant materials in industries has put considerable pressure on the scientific community to develop new polymer materials, chemicals, and fiber combinations for such applications.

This compilation concludes with an overview of the history, common raw materials, manufacturing processes, properties, functions and applications of nonwoven geotextiles. The potential use of recycled nonwoven geotextiles towards a more sustainable construction is also discussed.

PB 9781536175875 £87.99 May 2020 Nova Science Publishers 213 pages

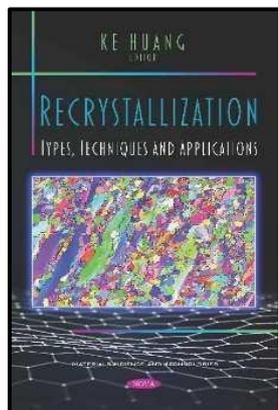


Boron Carbide Structure, Processing, Properties and Applications

Edited by Kolan Madhav Reddy

Boron carbide is a superhard and lightweight ceramic material. As a result of these characteristics, it used as a protective component in bulletproof vests, tank armour and also has many other industrial applications (e.g., tooling, abrasives). Research on boron carbide remains active given a long-standing challenge to understand its complex failure behavior in extreme environments owing to its unique microstructure and mechanical properties, where many current efforts are underway to improve its behavior through microstructure alteration via additives that form secondary phases, chemical doping, and altering the chemical composition of the boron-to-carbon ratio in the crystal structure. This book covers some of the key challenges involving boron carbide that are currently being studied by many materials scientists and ceramists. The authors who are active in this research field have prepared the chapters for this book and specific topics covered highlight the state-of-the art research in structure, processing, properties and applications. The organization of the book is designed to provide an easy understanding for students and professionals interested in advanced material for novel applications.

HB 9781536171211 £178.99 February 2020 Nova Science Publishers 322 pages



Recrystallization Types, Techniques and Applications

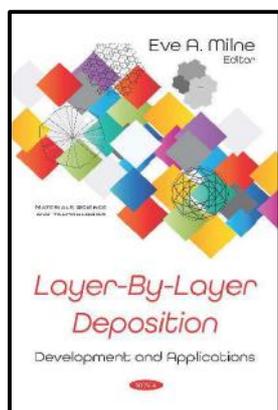
Edited by Ke Huang

A very large part of metallic materials is used in the wrought form. Several thermomechanical processing (TMP) steps are usually employed to produce the intermediate or final products, during which recrystallization and its related phenomena such as work hardening, recovery and grain growth may take place. The sophisticated controlling of recrystallization is one of the most effective ways to tailor the microstructures and mechanical properties of metallic components.

Recrystallization: Types, Techniques and Applications is the joint work of several well-known active scientists within this field, and each one focuses on the latest developments of their specific topics. This book covers the deformation structure and recovery, recrystallization and grain growth phenomena, characterization of recrystallization, interaction between recrystallization and solute/second phase particles, the competition between phase transformation and recrystallization, as well as numerical modelling of recrystallization.

It is a standard reference for practicing engineers and researchers involved in hot deformation and heat treatment of metallic materials.

HB 9781536167375 £211.99 February 2020 Nova Science Publishers 350 pages



Layer-By-Layer Deposition Development and Applications

Edited by Eve A. Milne

Layer-by-layer self-assembly is the most widely used strategy for the production of functional surfaces with tailored structures and chemical, biological, optical and electrical properties. Layer-by-layer approaches allow for the loading of bioactive molecules for tissue scaffolds, cardiovascular devices, implants, wound healing dressing, bone grafts, biosensors, drug delivery, and release systems.

Layer-By-Layer Deposition: Development and Applications also examines the physico-chemical bases underlying the fabrication of materials by the layer-by-layer method. Understanding the forces involved in the control of the assembly process is essential for the fabrication of materials with controlled properties, and structures.

Following this, the main principles and latest strategies of functionalized films, diamond core-shell structures, and graphene/graphene oxide nanocomposites by layer-by-layer self-assembly technology are extensively reviewed in detail, and these composites have been applied in the fields of biology, catalysis, and dye degradation.

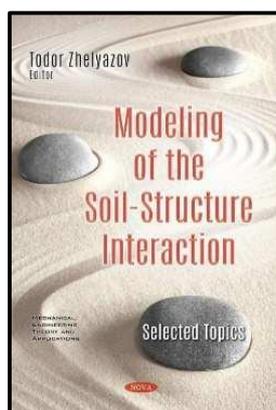
The authors study the layer-by-layer growth of quasiperiodic structures that are mathematical models of quasicrystals. This study is based on the concept of model sets proposed by Moody and generalizing the well-known “cut-and-project” method.

This compilation also reviews the current state of the art uses of the layer-by-layer strategy for providing natural and synthetic textile materials with flame retardant properties, reviewing and discussing the current advances.

The penultimate study focuses on how nisin peptides can be entrapped and released, creating an antibacterial food-contacting textile membrane. Biocatalytic membranes can be fabricated using entrapped enzymes.

Lastly, the different issues of multilayer emulsions with flaxseed and chia seed oil as omega-3 sources will be discussed, including their formation, composition, stability, characterization, and application.

HB 9781536169836 £178.99 February 2020 Nova Science Publishers 300 pages



Modeling of the Soil-Structure Interaction Selected Topics

Edited by Todor Zhelyazov

This edited book provides discussion and presents results related to some “hot topics,” all dealing with the soil-structure interaction. The book can be of interest to both scientists involved in academic studies of the problems addressed and for practitioners engaged in high-level design.

Chapter I reports the investigation of non-stationary wave propagation in continuously inhomogeneous cylindrical elements (such as pipelines). New results obtained by numerical analysis of non-stationary wave propagation are presented. The cases studied comprise simulations of the propagations of both one-dimensional and two-dimensional non-stationary waves. Waves of the first type are supposed to propagate in continuously inhomogeneous, linearly viscoelastic cylinders, whereas waves of the second type propagate in continuously inhomogeneous elastic cylinders. The authors of this chapter apply an original research method consisting of the implementation of solutions to dynamic problems in the study of elastic and linearly viscoelastic piecewise homogeneous bodies.

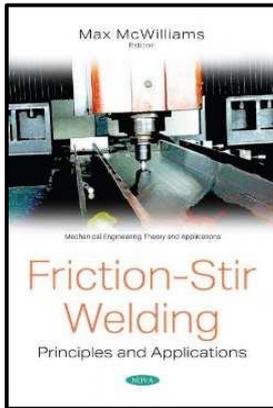
Chapter II outlines an analytical study of the propagation of different types of waves (plane, cylindrical, spherical) as well as of the waves' interaction with an element of Vibro-isolation (specifically, a three-layer plate). The author also presents the numerical results of the study of the distribution of the vibration accelerations in soil.

Chapter III presents details on the analytical modeling of a bearing device for passive seismic isolation (friction-pendulum system). The behavior of the slider is identical to a motion of a particle constrained to slide on a spherical surface. The analytical model includes equations of motion, derived using the Lagrange formalism and constitutive equations of the sliding interface. The author presents the results of the numerical simulation of the response of the bearing device to a seismic event, assuming a constant value of the friction coefficient.

Chapter IV proposes a discussion on the assessment of the load-carrying capacity of a metal-resin anchor and the determination of dependencies between parameters of supporting systems that include anchors. The solution to the problems addressed in this study involves an accurate analysis of the load transfer mechanisms between different system components. The proposed strategy requires the implementation of an algorithm aimed at the reconstruction of the analytical form of a function, provided its tabular form is available. The authors also formulate a theorem that postulates the existence of such representation applicable in a more general context.

The research object in Chapter V is the formulation of the boundary value problems for circular and annular three-layer plates subjected to axisymmetric loading. The considered plates consist of three layers: two thin bearing layers and one filler layer, with a perfect bond, assumed for all interfaces. The definition of the stress-strain state in the plates presumes that the Kirchhoff's hypotheses regarding the bearing layers and the Timoshenko's hypothesis (i.e., linear distribution of the tangential displacements over the thickness) concerning the filler layer hold. The performed analyses take into account the characteristics of the elastic (Winkler) foundation. The authors provide the obtained analytical solutions to the formulated boundary value problems. Results obtained by numerical analysis of the stress and the strain distributions for plates supported by hinges on the contour are also presented.

PB 9781536176834 £87.99 May 2020 Nova Science Publishers 168 pages



Friction-Stir Welding Principles and Applications

Edited by Max McWilliams

The principles and applications of friction-stir welding, a solid-state metal joining widely used to weld aluminum and its composites, are assessed. Friction stir processing, a novel process developed for microstructural modification of metallic materials, is also discussed.

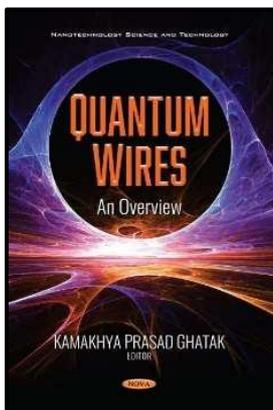
Academic studies and current sectoral applications of friction stir welding in shipbuilding are examined in detail. In addition, general literature reviews related to the joining of aluminum and steel with friction stir welding are explored.

The authors examine past research comparing the friction stir welding and submerged friction stir welding, use of different medium under which the welding is performed, design and process parameters, applications and possibility of future research.

In the closing study, a microstructural and statistical approach is performed to obtain a high strength welded joint in the dissimilar friction stir welding of AA 7075 and AA 6013 aluminum alloys.

PB 9781536183122 £75.99 August 2020 Nova Science Publishers 120 pages

Nanotechnology Science & Technology



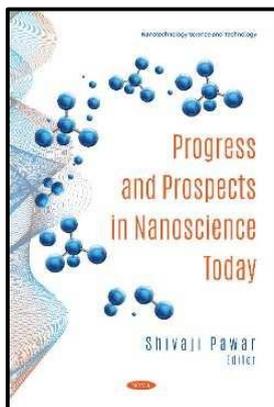
Quantum Wires An Overview

Edited by Kamakhya Prasad Ghatak

The Quantum Wires (QWs) occupy a central position in the whole field of nano-science and technology. In this edited book, in Chapter 1, the Fowler-Nordheim Field Emission from QWs has been studied and, in Chapter 2, the Effective Mass in Heavily Doped (HD) QWs has been investigated. The importance of Dispersion Relations is already well-known since the inception of Solid State Science, which has been studied in Chapter 3 in QWs of technologically important Non-Parabolic compounds. The Diffusivity Mobility Ratio and the Magneto Thermoelectric Power in QWs have been investigated in Chapters 4 and 5, respectively. In Chapters 6 and 7, the density-of-states function in HD superlattices in the presence of electric field has been explored as well as the Quantum Capacitance in Quantum Wire Field Effect Transistors. The importance of Einstein's Photoemission is already well-known and has been studied from Heavily Doped QWs in Chapter 8. In Chapter 9, the Magnetic susceptibility in the Magnetic Susceptibilities in QWs has been explored and, lastly, Chapter 10 discusses the Heisenberg's Uncertainty Principle (HUP) and the Carrier Contribution to the Elastic Constants in HD Opto electronic QWs.

This edited book is written for graduate and post graduate students, researchers, engineers and professionals in the fields of mechanical engineering, electrical and electronic engineering, semiconductors and related areas, nano-electronics, condensed matter physics, solid state sciences, materials science, nano-science and technology and nano-structured materials in general.

HB 9781536176766 £211.99 July 2020 Nova Science Publishers 419 pages



Progress and Prospects in Nanoscience Today

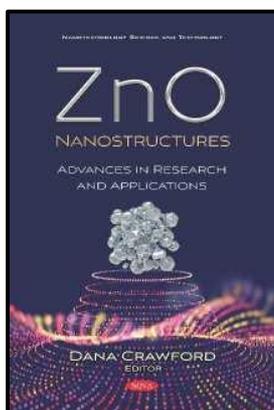
Edited by Shivaji Pawar

The book titled “Progress and Prospects in Nanoscience Today” is an extensive collection of learned materials and new results focusing on advances in nanoscience and nanomaterials for their applications by the contributing authors who are experts working in the fields of nanoscience, material science, energy, agricultural, computer science and engineering, atmospheric nanoscience, medicine, and nanobiotechnology. The book begins with a chapter on “Science of Nanomaterials”.

The formulation of this chapter serves as a foundation and is done in such a fashion that readers from a variety of disciplines with different background and willing to start research in interdisciplinary branch of science and make a career in nanotechnology. The second chapter presents basic concepts and methods of nanoscience, which are needed for human welfare. The first part addresses the function of imaging by scanning probe microscopy. This tool is operating with unprecedented sensitivity and resolution which promotes new views into structures and processes from the molecular to the sub-atomic level.

They contribute to fabricate new nano-sized systems and to open up new fields of application that range from novel quantum materials to biosystems and living matter. The third chapter reports the synthesis and physiochemical characteristics of silver nanoparticles. The next thirteen chapters report different properties of nanomaterials for their number of applications. These include: polymer composites in aerospace applications, photoluminescence properties, atmospheric nanoscience, agriculture, supercapacitors, hyperthermia therapy, wound dressing, antimicrobial applications, anti-biofilm-applications, tuberculosis diagnosis etc. The book will be a precious piece and basic knowledge material for those looking for new opportunities in the field of progress and prospects of nanoscience for technology development in different walks of industries. Each chapter is an icon of frontier level high quality research that has been undertaken in synthesis, characterization and application of variety of nanomaterials.

HB 9781536172928 £247.99 April 2020 Nova Science Publishers 431 pages



ZnO Nanostructures

Advances in Research and Applications

Edited by Dana Crawford

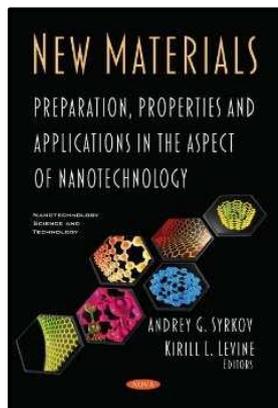
Different ZnO nanostructures are attributed to different electronic properties which are favourable in the application of photocatalysis, sensing and energy harvesting. The non toxic behaviour of ZnO nanostructures lead to the use of this material in environmental sensing and environmental remediation.

In *ZnO Nanostructures: Advances in Research and Applications*, a large-scale synthesis of undoped low-dimensional semiconductor metal oxide nanostructures is performed by simple wet-chemical method using reducing agents at low temperature. The detailed structural, compositional, and optical characterizations of the ZnO nanoparticles were evaluated by powder X-ray diffraction pattern, Fourier-transform infra-red spectroscopy, X-ray photoelectron spectroscopy, electron dispersion spectroscopy and UV-vis. Spectroscopy.

Following this, the authors describe the structure electrochemical sensors, listing scientific papers focusing on the detection of different pathogens and analytes, as well as reporting and comparing the performance of the sensors prepared by various groups around the world.

The concluding chapter deals with synthesis protocols of ZnO heterostructures along with their role in optoelectronic applications. Their thermodynamic stability and correlation among morphology, defects, and heterostructure with luminating and catalytic properties is also described.

PB 9781536167733 £87.99 January 2020 Nova Science Publishers 200 pages



New Materials Preparation, Properties and Applications in the Aspect of Nanotechnology

Edited by Andrey G. Syrkov

This book covers a wide field of theoretical and experimental investigations of organic and inorganic systems: preparation methods, functional properties characterization and modification and practical applications.

The first section includes studies in carbon structures of reduced dimensionality. Covered topics are: thermodynamic modeling of the behavior of fullerenes at heating in Argon, studying carbon nanotubes by X-ray diffraction, modelling of oscillating systems by cognitive digital systems.

The number of chapters describes the structural investigations of a wide variety of materials such as different sorts of steel in grained modification for mining equipment, elements of rock-breaking, crushing and grinding equipment; degradation of dielectrics, including nanostructured dielectrics, by migratory polarization.

Quantum chemical calculations were traditionally of a special interest of modelling nanostructured nuclei's. This method was applied to study titanium and vanadium nanocoating's formation from gas phase and to study quaternary ammonium compounds for modification of metal surfaces. Quantum-chemical calculations in bio-medical aspect made possible visualization ischemia-reperfusion injury using indocyanine green.

The final paper in the section contains a scientific essay, where peculiarities of quantum mechanics are traversed through findings of nanotechnology.

Section 2 includes the chapters related to preparation methods for the materials containing various components.

It is opened by research of nanoporous alumina, which is a promising material for printed circuit boards. Heat flow distribution was found to possess some interesting features.

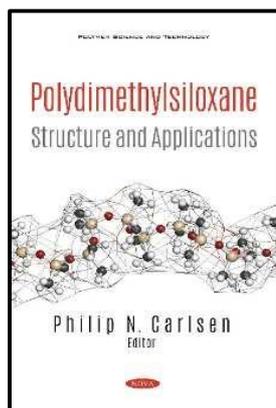
Physical properties of electrochemically grown metallic filaments studied by electron microscopy and diversity from dendritic to fractal structure was described.

Fractal thematic was also addressed with simulation of breakdown in plasma channel.

Section 3 is focused on the possibility of using new nanomaterials of different composition and design as powders for corundum ceramics, perfluorsulfonic membranes, refining noble methods from ultrafine valuable components, metals regeneration from oxide, and surface nanostructuring laser mechanisms.

Mentoring aspect - education of the young researchers involved in nanoscience and technology - is covered in chapter "Students Training on "Nanoengineering", which is also a very important and promising scientific field.

HB 9781536170900 £178.99 April 2020 Nova Science Publishers 264 pages



Polydimethylsiloxane Structure and Applications

Edited by Philip N. Carlsen

Polydimethylsiloxane is a non-conducting, silicone-based elastomer that is of widespread interest due to its flexibility and ease of micromolding for the rapid prototyping of microdevices and systems. Polydimethylsiloxane: Structure and Applications discusses the results of electric investigations of onion-like carbon (OLC)/polydimethylsiloxane composites addressing very wide frequency and temperature ranges.

Several kinds of devices for the observation of the behaviour of biological cells are discussed: micro-ridges, micro-grooves, micro-markers, and micro-slits, and the methodology to make each morphology by polydimethylsiloxane is described.

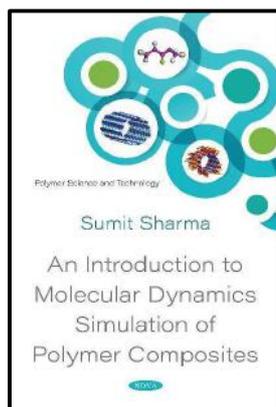
The authors reviews the main applications of polydimethylsiloxane in urinary tract devices and the associated complications. As new solutions are needed to reduce bacterial adhesion and biofilm formation on polydimethylsiloxane -based devices, a testing platform is described to evaluate surface performance in both urinary catheters and ureteral stents.

Also examined are the properties which make polydimethylsiloxane an excellent candidate for understanding complex biological behaviors, including its transparency for applying optical methods, biocompatibility and nontoxicity, high conformity with cells and other biostructures, gas permeability for the transfer of nutrients and oxygen, and flexibility.

In the subsequent study, a hybrid material of titanium dioxide and polydimethylsiloxane is obtained and characterized using a sol-gel and electrospraying method. These results indicate that the hybrid material may be viable as an adsorbent, and that the optimization of the process could reduce both cost and analysis time.

In order to further the applications of polydimethylsiloxane, the closing study describes the steps in the fabrication of its plasmonic structure, and also examines the switching effect of the sample.

HB 9781536175905 £146.99 July 2020 Nova Science Publishers 238 pages

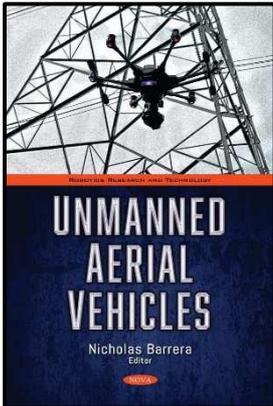


An Introduction to Molecular Dynamics Simulation of Polymer Composites

Sumit Sharma

This book will be beneficial for students, researchers and scientists working in the field of molecular dynamics simulation. In this book, Materials Studio software developed by Accelrys, a software company headquartered in the United States, has been used for performing the simulations and analysis. The source codes written in the book can be used by any one for modeling. The book starts with an introduction to molecular dynamics. Then various molecular dynamics methods will be discussed in detail. As the book progresses, various case studies related to modeling of composites at nano level will be discussed. The properties predicted are mechanical, thermal, optical and electrical. The concept of perl scripting has also been discussed in detail. Lastly the applications of molecular dynamics in various fields of engineering and technology will be discussed. The nanocomposite materials discussed in this book include polymer-matrix composites. The reinforcements used are carbon nanotubes, graphene, nanoparticles and nanofibers.

HB 9781536174083 £211.99 March 2020 Nova Science Publishers 351 pages



Unmanned Aerial Vehicles

Edited by Nicholas Barrera

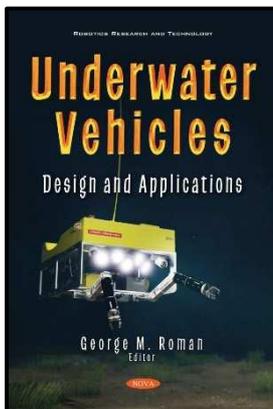
Unmanned Aerial Vehicles presents concepts important to any individual endeavoring to use unmanned aerial vehicles in work or research for the first time.

The capability of using unmanned aerial vehicles in performing atmospheric chemical measurements and in the design of sensor and sampling payloads is discussed, and a review of recent trends is provided.

The authors explore the concept of a universal flight and navigation system for small and ultra-small unmanned aerial vehicles with open architecture both in hardware and software terms.

The closing study details unmanned aerial vehicle photogrammetry, its idiosyncrasies, and its applicability in the conservation of archaeological objects.

HB 9781536189001 £178.99 December 2020 Nova Science Publishers 234 pages



Underwater Vehicles Design and Applications

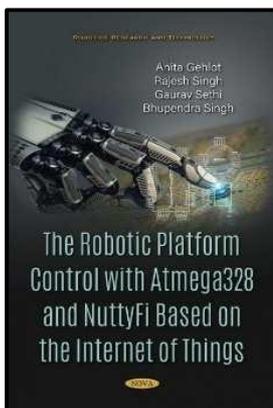
Edited by George M. Roman

Underwater Vehicles: Design and Applications first explores the application of the adaptive Kalman filter algorithm to the estimation of high speed autonomous underwater vehicle dynamics.

The authors investigate the performances of different control schemes, from non-model-based to model-based and adaptive model-based, implemented on a low-inertia underwater vehicle for three-dimensional helical trajectory tracking.

Control laws for collision avoidance in three-dimensional environments are introduced, considering scenarios where a vehicle detects arbitrarily shaped and nonconvex obstacles using sensors.

PB 9781536188769 £75.99 December 2020 Nova Science Publishers 98 pages

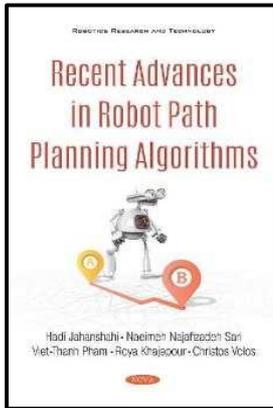


The Robotic Platform Control with Atmega328 and NuttyFi Based on the Internet of Things

Rajesh Singh

This book's aim is to explore the Robotic Platform Control with Atmega328 and NuttyFi based Internet of Things (IoT). IoT is network of networks and analytics system which exploits sensing, big data and artificial intelligence technology for complete system or service. IoT has applications across industries due to its unique flexibility and ability to be suitable in any environment. This book provides the basic knowledge of mobile apps with their design steps and programs. The objective of this book is to discuss the various methods to control the robotic platform where the Internet of Things plays an important role. This text is beneficial for people who want to get started with hardware-based robotics prototypes using the IoT. Mobile platform is one of the most popular devices. It is designed for sports robots (football, volleyball etc.), rescue operations (fire-fighting, person or object finding etc.) and many other uses. This book discusses the different components required in the design process of the robot.

HB 9781536174724 £146.99 April 2020 Nova Science Publishers 235 pages



Recent Advances in Robot Path Planning Algorithms A Review of Theory and Experiment

Edited by Christos K. Volos

The dominant theme of this book is to introduce the different path planning methods and present some of the most appropriate ones for robotic routing; methods that are capable of running on a variety of robots and are resistant to disturbances; being real-time, being autonomous, and the ability to identify high-risk areas and risk management are the other features that will be mentioned in the introduction of the methods.

The introduction of the profound significance of the robots and delineation of the navigation and routing theme is provided in the first chapter of the book.

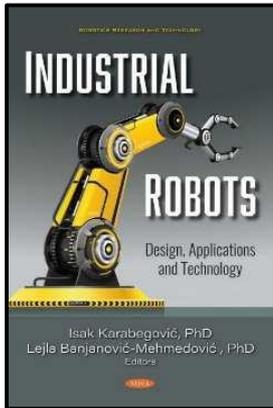
The second chapter is concerned with the subject of routing in unknown environments. In the first part of this chapter, the family of bug algorithms including are described. In the following, several conventional methods are submitted. The last part of this chapter is dedicated to the introduction of two recently developed routing methods.

In Chapter 3, routing is reviewed in the known environment in which the robot either utilizes the created maps by extraneous sources or makes use of the sensor in order to prepare the maps from the local environment.

The robot path planning relying on the robot vision sensors and applicable computing hardware are concentrated in the fourth chapter. The first part of this chapter deals with routing methods supported mapping capabilities. The second part manages the routing dependent on the vision sensor, typically known as the best sensor, within the routing subject. The movement of two-dimensional robots with two or three degrees of freedom is analyzed within the third part of this chapter.

In Chapter 5, the performance of a few of the foremost important routing methods initiating from the second to fourth chapters is conferred regarding the implementation in various environments. The first part of this chapter is engaged in the implementation of the algorithms Bug1, Bug2, and Distbug on the pioneering robot. In the second part, a theoretical technique is planned to boost the robot's performance in line with obstacle collision avoidance. This method, underlying the tangential escape, seeks to proceed with the robot through various obstacles with curved corners. In the third and fourth parts of this chapter, path planning in different environments is preceded in the absence and the presence of danger space. Accordingly, four approaches, named artificial fuzzy potential field, linguistic technique, Markov decision making processes, and fuzzy Markov decision making have been proposed in two following parts and enforced on the Nao humanoid robot.

HB 9781536167955 £146.99 February 2020 Nova Science Publishers 224 pages



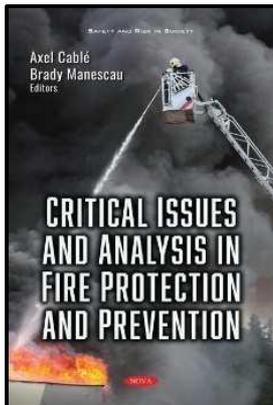
Industrial Robots Design, Applications and Technology

Edited by Isak Karabegović

Industrial Robots: Design, Applications and Technology is an essential reference source that explores the fundamentals of kinematics, dynamics and industrial robot control as well as a new generation of industrial robots, the collaborative robots or cobots. The tendency in Industry 4.0 towards the mass customisation of products, shorter product cycles and quality demands has led to the introduction of collaborative robot's systems capable of learning and working hand-in-hand with humans. Collaborative robots in the industry target the enhancement of production efficiency by combining the best of human operators and the industrial robots' accuracy, speed and reliability. The advances in smart sensors, artificial intelligence, digital twin, cyber-physical systems and the adoption of exoskeletons in industrial applications have opened new possibilities for technological progress in manufacturing, which led to efficient and flexible factories. This requires individuals to be educated in trends that are now focused on the design, monitoring and control of smart production processes. Featuring coverage on a wide range of topics such as new trends in human-robot collaboration, advanced vision technology and artificial intelligence, as well as application of industry robots in metal and wood industry, this book is ideally designed for electrical engineers, mechanical engineers, manufacturers, supply chain managers, logistics specialists, investors, managers, policymakers, production scientists, researchers, academicians and students at the postgraduate level.

HB 9781536177794 £247.99 June 2020 Nova Science Publishers 461 pages

Safety & Risk in Society



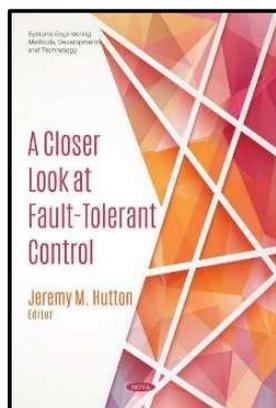
Critical Issues and Analysis in Fire Protection and Prevention

Edited by Axel Cablé

With an estimated 135,000 reported fire incidents occurring each day worldwide (CTIF World Fire Statistics Center, 2020), fire safety is a major societal and safety issue. Fires have an enormous impact on people's lives and well-being. They cause massive amounts of air pollution, increase carbon emissions, and are responsible for the loss of invaluable natural and cultural heritage.

In the current context of climate change, it is hence crucial to develop appropriate preventive and protective measures against fire. This book is a compilation of studies and advances on the current state of research related to critical issues and analysis in the field of fire safety, with chapter contributions from various countries and research institutions worldwide (Australia, Chile, France, India and USA). It aims to provide a broad picture of currently faced challenges and potential solutions from passive and active protective measures, to modelling and experimentation related to compartment and wild fires.

HB 9781536187380 £146.99 October 2020 Nova Science Publishers 218 pages



A Closer Look at Fault-Tolerant Control

Edited by Jeremy M. Hutton

A Closer Look at Fault-Tolerant Control first presents the application of a fault tolerant control system on distillation processes, with automatic actuator faults containment capabilities and an atmospheric crude distillation unit.

Following this, model-based fault-tolerant control and fault accommodation algorithms are presented for two challenging classes of distributed systems: a spatially distributed system that can be decomposed into interconnected subsystems, and a distributed parameter system where the system state is distributed over a continuous range of space.

The authors present recent research on fault-tolerant control systems for unmanned aerial systems, particularly for multirotor-type vehicles commonly known as drones.

An overview of tools for the analysis of the fundamental properties of an automated system is provided, allowing for any inherent redundancy in the controlled process to be utilised to maintain availability.

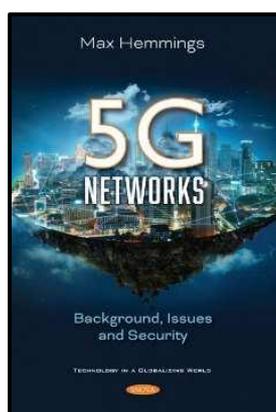
Additionally, a reconfigurable fault-tolerant flight control system is proposed to combat sensor/actuator faults for autonomous underwater vehicles.

The reconfigurable design and operation of complex systems is addressed, with emphasis on autonomous systems, building upon concepts of autonomy, incipient failure diagnosis and prognosis algorithms.

The authors present a fault detection filter for induction motors speed as a class of nonlinear system in networked control systems subject to induced time delays. The multi-model approach for the modeling of induction motors is described using a set of linear models.

HB 9781536175288 £211.99 May 2020 Nova Science Publishers 348 pages

Technology in a Globalizing World



5G Networks

Background, Issues and Security

Edited by Max Hemmings

Since the first mobile phones were made available in the 1980s, telecommunication providers have been investing in mobile networks to expand coverage, improve services, and attract more users. First-generation networks supported mobile voice calls but were limited in coverage and capacity. To address those limitations, providers developed and deployed second-generation (2G) mobile networks, then third-generation (3G), and fourth-generation (4G) networks. Each generation offered improved speeds, greater capacity, and new features and services.

In 2018, telecommunication providers began deploying fifth-generation (5G) networks to meet growing demands for data from consumer and industrial users. 5G networks are expected to enable providers to expand consumer services (e.g., video streaming, virtual reality applications), support the growing number of connected devices (e.g., medical devices, smart homes, Internet of Things), support new industrial uses (e.g., industrial sensors, industrial monitoring systems), perform advanced data analytics, and enable the use of advanced technologies (e.g., smart city applications, autonomous vehicles). This book provides a background on mobile technologies, and addresses the race to 5G, factors affecting 5G deployment, and national security.

HB 9781536189728 £211.99 December 2020 Nova Science Publishers 417 pages



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