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## **6RIOTP - KRISTOPHER SANCHEZ**

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This book introduces an innovative and high-efficiency technology for mechanical energy harvesting. The book covers the history and development of triboelectric nanogenerators, basic structures, working principles, performance characterization, and potential applications. It is divided into three parts: Part A illustrates the fundamental working modes of triboelectric nanogenerators with their prototype structures and theoretical analysis; Part B and Part C introduce two categories of applications, namely self-powered systems and self-powered active sensors. The book will

be an ideal guide to scientists and engineers beginning to study triboelectric nanogenerators or wishing to deepen their knowledge of the field. Readers will be able to place the technical details about this technology in context, and acquire the necessary skills to reproduce the experimental setups for fabrication and measurement.

An essential resource for understanding the potential role for biomass energy with carbon capture and storage in addressing climate change Biomass Energy with Carbon Capture and Storage (BECCS) offers a comprehensive review of the characteristics of BECCS technologies in relation to its various applications. The au-

thors — a team of expert professionals — bring together in one volume the technical, scientific, social, economic and governance issues relating to the potential deployment of BECCS as a key approach to climate change mitigation. The text contains information on the current and future opportunities and constraints for biomass energy, explores the technologies involved in BECCS systems and the performance characteristics of a variety of technical systems. In addition, the text includes an examination of the role of BECCS in climate change mitigation, carbon accounting across the supply chain and policy frameworks. The authors also offer a review of the social and ethical aspects as well as the costs and economics of BECCS. This important text: Reveals the role BECCS could play in the transition to a low-carbon economy Discusses the wide variety of technical and non-technical constraints of BECCS Presents the basics of biomass energy systems Reviews the technical and engineering issues pertinent to BECCS Explores the societal implications of BECCS systems Written for academics and research professionals, Biomass Energy with Carbon Capture and Storage (BECCS) brings together in one volume the issues surrounding BECCS in an accessible and authoritative manner.

This text is a companion volume to Transmission Electron Microscopy: A Textbook for Materials Science by Williams and Carter. The aim is to extend the discussion of certain topics that are either rapidly changing at this time or that would benefit from more detailed discussion than space allowed in the primary text. World-renowned researchers have contributed chapters in their area of expertise, and the editors have carefully prepared these chapters to provide a uniform tone and treatment for this exciting material. The book features an unparalleled collection of color figures

showcasing the quality and variety of chemical data that can be obtained from today's instruments, as well as key pitfalls to avoid. As with the previous TEM text, each chapter contains two sets of questions, one for self assessment and a second more suitable for homework assignments. Throughout the book, the style follows that of Williams & Carter even when the subject matter becomes challenging—the aim is always to make the topic understandable by first-year graduate students and others who are working in the field of Materials Science Topics covered include sources, in-situ experiments, electron diffraction, Digital Micrograph, waves and holography, focal-series reconstruction and direct methods, STEM and tomography, energy-filtered TEM (EFTEM) imaging, and spectrum imaging. The range and depth of material makes this companion volume essential reading for the budding microscopist and a key reference for practicing researchers using these and related techniques.

You can count on McDonald: the go-to source for expert, complete coverage of oral care for infants, children, and teenagers for over half a century. McDonald and Avery's Dentistry for the Child and Adolescent, 10th Edition discusses pediatric examination, development, morphology, eruption of the teeth, and dental caries in depth — and emphasizes prevention and the treatment of the medically compromised patient. Boasting a new design and handy Evolve site, this new edition by Jeffrey A. Dean equips you with the latest diagnostic and treatment recommendations in the fast-growing field of pediatric dentistry. Complete, one-source coverage includes the best patient outcomes for all of the major pediatric treatments in prosthodontics, restorative dentistry, trauma management, occlusion, gingivitis and periodontal disease,

and facial esthetics. A clinical focus includes topics such as such as radiographic techniques, dental materials, pit and fissure sealants, and management of cleft lip and palate. Practical discussions include practice management and how to deal with child abuse and neglect. Evolve site provides you with the best learning tools and resources. UPDATED! More emphasis on preventative care and treatment of medically compromised patients helps you provide more effective care. NEW! Easier-to-follow design.

Proceedings from the first International Symposium on Primo Vascular System 2010 (ISPS 2010) with special topics on cancer and regeneration was held in Jecheon, Korea during September 17-18, 2010. Includes coverage of new study results that have better revealed the functional aspects of PVS, including its roles in the areas of regenerative medicine and cancer.

See how to effectively manage ALL dental implant complications throughout ALL phases of treatment! Avoiding Complications in Oral Implantology provides evidence-based management protocols for a wide range of implant problems such as placement complications, malpositioning, bleeding, infection, and nerve injuries. Hundreds of high-quality, full-color photos and illustrations clearly demonstrate the complications and their resolution. Edited by Carl Misch and Randolph Resnik — both well-known names in dental implantology and prosthodontics — and with a team of expert contributors, this authoritative guide helps you handle the implant-related complications that can occur as more and more patients choose dental implants. Expert authors are joined by a panel of recognized leaders in implant dentistry — many of whom are associated with the Misch International Implant Institute — to share

their extensive experience with handling complications through all phases of treatment. Comprehensive approach to complications that occur in the different phases of oral implantology provides the knowledge and skills you need to handle treatment planning, implant placement, post-operative complications, prostheses-related complications, and more. Over 1,000 images include full-color clinical photographs, radiographs, line drawings, and diagrams, clearly demonstrating complications, procedures, and outcomes. Management protocols developed by world-renowned dental implantologists provide a proven system and authoritative guidance in managing complications with dental implants. Evidence-based solutions make it easier to manage a wide variety of clinical problems associated with dental implants, with state-of-the-art guidance supported by the best available research.

The assessment of cancer risk is a complex process that requires the examination of etiological agents, real-world environments, and individual rates of exposure. This reference offers practical approaches to determine cancer risk in individuals, groups of exposed persons, and the general public in relation to individual genetic and acquired suscep

This open access book presents multidisciplinary research on the cultural history, ethnic connectivity, and oceanic transportation of the ancient Indigenous Bai Yue (百越) in the prehistoric maritime region of southeast China and southeast Asia. In this maritime Frontier of China, historical documents demonstrate the development of the “barbarian” Bai Yue and Island Yi (岛夷) and their cultural interaction with the northern Huaxia (华夏) in early Chinese civilization within the geopolitical order of the “Central State-Four Peripheries Barbarians-Four Seas”. Archaeological typologies of the

prehistoric remains reveal a unique cultural tradition dominantly originating from the local Paleolithic age and continuing to early Neolithization across this border region. Further analysis of material culture from the Neolithic to the Early Iron Age proves the stability and resilience of the indigenous cultures even with the migratory expansion of Huaxia and Han (汉) from north to south. Ethnographical investigations of aboriginal heritage highlight their native cultural context, seafaring technology and navigation techniques, and their interaction with Austronesian and other foreign maritime ethnicities. In a word, this manuscript presents a new perspective on the unique cultural landscape of indigenous ethnicities in southeast China with thousands of years' stable tradition, a remarkable maritime orientation and overseas cultural hybridization in the coastal region of southeast China.

This book provides an overview of the environmental problems that arise from construction activity, focusing on refurbishment as an alternative to the current crisis in the construction sector, as well as on measures designed to minimize the effects on the environment. Furthermore, it offers professionals insights into alternative eco-efficient solutions using new materials to minimize environmental impacts and offers solutions that they can incorporate into their own designs and buildings. It also demonstrates best practices in the cooperation between various universities in Andalusia in Spain and Latin America and many public and private companies and organizations. This book serves as a valuable reference resource for professionals and researchers and provides an overview on the status of investigations to find solutions to improve sustainable development in terms of materials, sys-

tems, facilities, neighborhoods, buildings, and awareness of the society involved.

A very readable and well illustrated 1999 clinical guide to the common side effects of antipsychotic medication.

These essays explicitly confront a particular crisis in postwar art, seeking to examine the assumptions on which the modern commercial and museum gallery was based.

Provides the latest information on all aspects of using temporary anchorage devices in clinical orthodontics, from diagnosis and treatment planning to appliances and applications. Written by some of the world's leading experts in orthodontics, *Temporary Anchorage Devices in Clinical Orthodontics* is a comprehensive, up-to-date reference that covers all aspects of temporary anchorage device (TAD) use in contemporary orthodontics. Taking a real-world approach to the subject, it covers topics ranging from diagnosis and treatment planning to the many applications and management of complications. Case studies demonstrate the concepts, and high-quality clinical photographs support the text throughout. The book begins with an overview of clinical applications and fundamental principles of TADs. It then goes on to cover biomechanical considerations for controlling target tooth movement with TADs. Biomechanical simulations for various clinical scenarios treated with TADs are addressed next, followed by an examination of histological aspects during the healing process and anatomical considerations with TADs. Other chapters cover: Class II Correction with TADs, Distalization with TADs, TAD-anchored Maxillary Protraction, Maxillary Expansion with TADs, Anterior Open Bite Correction with TADs, TAD-assisted Aligner Therapy, TADs vs. Orthognathic Surgery; Legal Considerations When Us-

ing TADs; and much more. Provides evidence-based information on the use of TADs, with a focus on improving outcomes for patients. Considers topics ranging from diagnosis and treatment planning to specific clinical applications and appliances. Takes a real-world clinical approach, with case studies demonstrating concepts. Written by international experts in the field. Presents hundreds of high-quality clinical photographs to support the text. Temporary Anchorage Devices in Clinical Orthodontics is an essential resource for orthodontists and orthodontic residents.

Anchorage control is one of the most challenging tasks in orthodontic treatment. Many different types of appliance are used to control anchorage, but an excellent outcome may be difficult to achieve owing to either poor mechanics or inadequate patient compliance. Recently, temporary skeletal anchorage devices (TSADs) have become popular in orthodontics. Some orthodontic movements that are now possible using TSADs were previously considered almost impossible with traditional orthodontic appliances. Several different types of TSAD are currently available, and in choosing between them orthodontists are obliged to rely on the information provided by manufacturers, which is often not based on scientific evidence. This book therefore presents the various design characteristics of TSADs and provides up-to-date scientific evidence to assist orthodontists in selecting the best TSADs for their patients.

A look inside the hidden world of Korean women by one of that country's best-known feminist writers.

Electrospun Nanofibers covers advances in the electrospinning process including characterization, testing and modeling of elec-

trospun nanofibers, and electrospinning for particular fiber types and applications. Electrospun Nanofibers offers systematic and comprehensive coverage for academic researchers, industry professionals, and postgraduate students working in the field of fiber science. Electrospinning is the most commercially successful process for the production of nanofibers and rising demand is driving research and development in this field. Rapid progress is being made both in terms of the electrospinning process and in the production of nanofibers with superior chemical and physical properties. Electrospinning is becoming more efficient and more specialized in order to produce particular fiber types such as bicomponent and composite fibers, patterned and 3D nanofibers, carbon nanofibers and nanotubes, and nanofibers derived from chitosan. Provides systematic and comprehensive coverage of the manufacture, properties, and applications of nanofibers. Covers recent developments in nanofibers materials including electrospinning of bicomponent, chitosan, carbon, and conductive fibers. Brings together expertise from academia and industry to provide comprehensive, up-to-date information on nanofiber research and development. Offers systematic and comprehensive coverage for academic researchers, industry professionals, and postgraduate students working in the field of fiber science.

In recent decades, Korean communication and media have substantially grown to become some of the most significant segments of Korean society. Since the early 1990s, Korea has experienced several distinctive changes in its politics, economy, and technology, which are directly related to the development of local media and culture. Korea has greatly developed several cutting-edge technologies, such as smartphones, video games, and mobile ins-

tant messengers to become the most networked society throughout the world. As the Korean Wave exemplifies, the once small and peripheral Korea has also created several unique local popular cultures, including television programs, movies, and popular music, known as K-pop, and these products have penetrated many parts of the world. As Korean media and popular culture have rapidly grown, the number of media scholars and topics covering these areas in academic discourses has increased. These scholars' interests have expanded from traditional media, such as Korean journalism and cinema, to several new cutting-edge areas, like digital technologies, health communication, and LGBT-related issues. In celebrating the Korean American Communication Association's fortieth anniversary in 2018, this book documents and historicizes the growth of growing scholarship in the realm of Korean media and communication.

Offering thorough coverage of atomic layer deposition (ALD), this book moves from basic chemistry of ALD and modeling of processes to examine ALD in memory, logic devices and machines. Reviews history, operating principles and ALD processes for each device.

Sintering is one of the final stages of ceramics fabrication and is used to increase the strength of the compacted material. In the Sintering of Ceramics section, the fabrication of electronic ceramics and glass-ceramics were presented. Especially dielectric properties were focused on. In other chapters, sintering behaviour of ceramic tiles and nano-alumina were investigated. Apart from oxides, the sintering of non-oxide ceramics was examined. Sintering the metals in a controlled atmosphere furnace aims to bond

the particles together metallurgically. In the Sintering of Metals section, two sections dealt with copper containing structures. The sintering of titanium alloys is another topic focused in this section. The chapter on lead and zinc covers the sintering in the field of extractive metallurgy. Finally two more chapter focus on the basics of sintering, i.e viscous flow and spark plasma sintering.

The ASCRS Textbook of Surgery of the Colon and Rectum offers a comprehensive textbook designed to provide state of the art information to residents in training and fully trained surgeons seeking recertification. The textbook also supports the mission of the ASCRS to be the world's authority on colon and rectal disease. The combination of junior and senior authors selected from the membership of the ASCRS for each chapter will provide a comprehensive summary of each topic and allow the touch of experience to focus and temper the material. This approach should provide the reader with a very open minded, evidence based approach to all aspects of colorectal disease. Derived from the textbook, The ASCRS Manual of Surgery of the Colon and Rectum offers a "hands on" version of the textbook, written with the same comprehensive, evidence-based approach but distilled to the clinical essentials. In a handy pocket format, readers will find the bread and butter information for the broad spectrum of practice. In a consistent style, each chapter outlines the condition or procedure being discussed in a concise outline format - easy to read, appropriately illustrated and referenced.

Owing to their unique state of preservation, mummies provide us with significant historical and scientific knowledge of mankind's past. This handbook, written by prominent international experts in mummy studies, offers readers a comprehensive guide to new

understandings of the field's most recent trends and developments. It provides invaluable information on the health states and pathologies of historic populations and civilizations, as well as their socio-cultural and religious characteristics. Addressing the developments in mummy studies that have taken place over the past two decades -- which have been neglected for as long a time -- the authors excavate the ground-breaking research that has transformed scientific and cultural knowledge of our ancient predecessors. The handbook investigates the many new biotechnological tools that are routinely applied in mummy studies, ranging from morphological inspection and endoscopy to minimally invasive radiological techniques that are used to assess states of preservation. It also looks at the paleoparasitological and pathological approaches that have been employed to reconstruct the lifestyles and pathologic conditions of ancient populations, and considers the techniques that have been applied to enhance biomedical knowledge, such as craniofacial reconstruction, chemical analysis, stable isotope analysis and ancient DNA analysis. This interdisciplinary handbook will appeal to academics in historical, anthropological, archaeological and biological sciences, and will serve as an indispensable companion to researchers and students interested in worldwide mummy studies.

This issue of Oral and Maxillofacial Surgery Clinics of North America is devoted to Advances in Oral and Maxillofacial Surgery and is edited by Drs. Jose M. Marchena, Jonathan Shum and Jonathon S. Jundt. Articles will include: Virtual Surgical Planning for Maxillofacial Surgery; Surgical Navigation for Oral and Maxillofacial Surgery; Real Time Adjuncts for Dental Implant Placement; New

Technologies for Tissue Cutting; Minimally Invasive Maxillofacial Surgery; Conservative Approaches to Benign Pathology; Tissue Engineering; Patient-Specific Implants; Practice Management in Oral and Maxillofacial Surgery; Advances in Anesthesia Monitoring; Advances in Surgical Training: Simulation; Advances in Functioning Imaging; and more!

Functional Neuroradiology: Principles and Clinical Applications, is a follow-up to Faro and Mohamed's groundbreaking work, Functional (BOLD)MRI: Basic Principles and Clinical Applications. This new 49 chapter textbook is comprehensive and offers a complete introduction to the state-of-the-art functional imaging in Neuroradiology, including the physical principles and clinical applications of Diffusion, Perfusion, Permeability, MR spectroscopy, Positron Emission Tomography, BOLD fMRI and Diffusion Tensor Imaging. With chapters written by internationally distinguished neuroradiologists, neurologists, psychiatrists, cognitive neuroscientists, and physicists, Functional Neuroradiology is divided into 9 major sections, including: Physical principles of all key functional techniques, Lesion characterization using Diffusion, Perfusion, Permeability, MR spectroscopy, and Positron Emission Tomography, an overview of BOLD fMRI physical principles and key concepts, including scanning methodologies, experimental research design, data analysis, and functional connectivity, Eloquent Cortex and White matter localization using BOLD fMRI and Diffusion Tensor Imaging, Clinical applications of BOLD fMRI in Neurosurgery, Neurology, Psychiatry, Neuropsychology, and Neuropharmacology, Multi-modality functional Neuroradiology, Beyond Proton Imaging, Functional spine and CSF imaging, a full-color Neuroanatomical Brain atlas of eloquent cortex and key white matter tracts and

BOLD fMRI paradigms. By offering readers a complete overview of functional imaging modalities and techniques currently used in patient diagnosis and management, as well as emerging technology, *Functional Neuroradiology* is a vital information source for physicians and cognitive neuroscientists involved in daily practice and research.

This book introduces the concept, design and application of green biocomposites, with a specific focus on the current demand for green biocomposites for automotive and aerospace components. It discusses the mathematical background, innovative approaches to physical modelling, analysis and design techniques. Including numerous illustrations, tables, case studies and exercises, the text summarises current research in the field. It is a valuable reference resource for researchers, students and scientists working in the field of materials science.

This book is a comprehensive guide to the surgery-first orthognathic approach for patients with malocclusion and skeletal disharmony, which has been successfully applied by the authors in their practices over the past 15 years. The approach breaks with the time-tested principles of traditional orthognathic surgery in that corrective bone surgery is performed first, without the removal of dental compensations, followed by orthodontic finishing. All aspects are covered with the aid of numerous illustrations, the aim being to provide surgeons with a systematic educational tool that will enable them to introduce the approach into their own practice. In addition, the book addresses one of the hot issues in orthodontics, occlusal plane-altering orthognathic surgery, in which surgical modification of the occlusal plane is employed to treat various types of dentofacial deformity and improve facial

proportions. This promises to become a very powerful tool in modern orthognathic surgery.

The five-volume set LNCS 7971-7975 constitutes the refereed proceedings of the 13th International Conference on Computational Science and Its Applications, ICCSA 2013, held in Ho Chi Minh City, Vietnam in June 2013. The 248 revised papers presented in five tracks and 33 special sessions and workshops were carefully reviewed and selected. The 46 papers included in the five general tracks are organized in the following topical sections: computational methods, algorithms and scientific applications; high-performance computing and networks; geometric modeling, graphics and visualization; advanced and emerging applications; and information systems and technologies. The 202 papers presented in special sessions and workshops cover a wide range of topics in computational sciences ranging from computational science technologies to specific areas of computational sciences such as computer graphics and virtual reality.

This book is about the substitution treatment of a missing 1st molar with protraction (forward movement) of the 2nd and 3rd molars by orthodontic space closure. It is one of the most recent treatment methods using miniscrews (TADs: Temporary Anchorage Devices). In cases of missing teeth--not only the 1st molar but also other teeth--an implant or prosthetic treatment is usually necessary. However, what if the patient considers receiving orthodontic treatment after an implant or prosthetics? Orthodontic treatment would become very difficult because an implant or prosthetics would prohibit orthodontic teeth movement. Figures on the front cover of this book show that the 2nd and 3rd molars

have mesially drifted to the missing 1st molar space. The formerly impacted (unable to come in) 3rd molar erupted (came in) properly. Therefore, the 2nd and 3rd molars can function as the 1st and 2nd molars, respectively. In this case, troublesome extraction of the impacted 3rd molar and an implant or prosthetic treatment was unnecessary. Is this possible in all cases? If yes, then to what extent? Would there be any other problems in the periodontal and root structure? The substitution treatment of a missing 1st molar may also have its own risks, but if successful, it can largely benefit patients. This book is an organization of the 110 cases that I have treated, discussing both the positive and negative aspects of the concerned treatment. In addition, this book highlights missing space closure of the 1st molar because it is the most difficult type of orthodontic space closure. The missing space of other teeth is generally easier to close. Prosthodontic, endodontic, or periodontic doctors may have more chances to meet patients who have missing teeth than orthodontic specialists. I'd like to suggest that these doctors take this orthodontic treatment into consideration. Patients, as well as dentists, must be aware of various treatment options, including orthodontic treatment methods. I hope it can be a good option for missing teeth.

Breast cancer is the leading cause of cancer-related deaths in women, and its prevalence has been steadily rising in recent decades. This book describes morphologic and kinetic signs that are important in the analysis of breast MR images before and after contrast administration and in various pulse sequences. It will help broaden the clinical application of MRM so that as many physicians as possible can make more accurate diagnoses.

Polymers continue to play an ever increasing role in the modern world. In fact it is quite inconceivable to most people that we could ever have existed of the increased volume and variety of materials without them. As a result currently available, and the diversity of their application, characterisation has become an essential requirement of industrial and academic laboratories involved with polymeric materials. On the one hand requirements may come from polymer specialists involved in the design and synthesis of new materials who require a detailed understanding of the relationship between the precise molecular architecture and the properties of the polymer in order to improve its capabilities and range of applications. On the other hand, many analysts who are not polymer specialists are faced with the problems of analysing and testing a wide range of polymeric materials for quality control or material specification purposes. We hope this book will be a useful reference for all scientists and techno or industrial laboratories, logists involved with polymers, whether in academic and irrespective of their scientific discipline. We have attempted to include in one volume all of the most important techniques. Obviously it is not possible to do this in any great depth but we have encouraged the use of specific examples to illustrate the range of possibilities. In addition numerous references are given to more detailed texts on specific subjects, to direct the reader where appropriate. The book is divided into 11 chapters.

This book features research papers presented at the International Conference on Emerging Technologies in Data Mining and Information Security (IEMIS 2018) held at the University of Engineering & Management, Kolkata, India, on February 23-25, 2018. It

comprises high-quality research work by academicians and industrial experts in the field of computing and communication, including full-length papers, research-in-progress papers, and case studies related to all the areas of data mining, machine learning, Internet of Things (IoT) and information security.

Achieve excellent patient outcomes with minimally invasive, cost-effective procedures! Temporary Anchorage Devices in Orthodontics, 2nd Edition covers everything you need to know to begin offering TADs in your practice. More than 1,500 full-color photos and illustrations guide you through the entire treatment process, from diagnosis and planning to biomechanics, implants and anchorage devices, and management of problems. Detailed case reports provide insight into the treatment of specific conditions. From a team of expert contributors led by Ravindra Nanda, this book shows the temporary anchorage techniques that will take your orthodontic skills to the next level. Over 1,500 full-color clinical photographs and line drawings depict important concepts and techniques, and show treatment progress from beginning to end. Case Report boxes walk you through the treatment of specific conditions, from initial patient visit to final outcome, with clinical photos showing the changes that occur at each stage of treatment. Unique coverage of temporary anchorage devices is provided by this complete, comprehensive, one-of-a-kind reference, as the use of TADs is becoming more and more popular within the field of orthodontics. Expert contributors from all over the world share their experience and current knowledge of each topic, ensuring that you have accurate, up-to-date, and clinically relevant information. Logical organization begins with a discussion of basic orthodontic principles and moves on to diagnosis and treatment

planning, implants and anchorage devices, and management of problems. NEW Anchorage of TADs Using Aligner Orthodontics Treatment for Lower Molars Distalization chapter helps you incorporate TADs to clear aligner therapy. NEW Expert Consult website provides an online version of the book, allowing you to search the entire book electronically. NEW! Updated clinical photos illustrate the advances that have been made since publication of the first edition. NEW! Updated content reflects the latest research and advances in this evolving area.

An expanded and updated edition of a comprehensive presentation of the theory and practice of model checking, a technology that automates the analysis of complex systems. Model checking is a verification technology that provides an algorithmic means of determining whether an abstract model—representing, for example, a hardware or software design—satisfies a formal specification expressed as a temporal logic formula. If the specification is not satisfied, the method identifies a counterexample execution that shows the source of the problem. Today, many major hardware and software companies use model checking in practice, for verification of VLSI circuits, communication protocols, software device drivers, real-time embedded systems, and security algorithms. This book offers a comprehensive presentation of the theory and practice of model checking, covering the foundations of the key algorithms in depth. The field of model checking has grown dramatically since the publication of the first edition in 1999, and this second edition reflects the advances in the field. Reorganized, expanded, and updated, the new edition retains the focus on the foundations of temporal logic model while offering new chapters that cover topics that did not exist in 1999: proposi-

tional satisfiability, SAT-based model checking, counterexample-guided abstraction refinement, and software model checking. The book serves as an introduction to the field suitable for classroom use and as an essential guide for researchers.

This book presents selected papers from the 3rd International Conference on Micro-Electronics and Telecommunication Engineering, held at SRM Institute of Science and Technology, Ghaziabad, India, on 30-31 August 2019. It covers a wide variety of topics in micro-electronics and telecommunication engineering, including micro-electronic engineering, computational remote sensing, computer science and intelligent systems, signal and image processing, and information and communication technology.

Silicon (Si) is by far the most widely used semiconductor material for power devices. On the other hand, Si-based power devices are approaching their material limits, which has provoked a lot of efforts to find alternatives to Si-based power devices for better performance. With the rapid innovations and developments in the semiconductor industry, Silicon Carbide (SiC) power devices have progressed from immature prototypes in laboratories to a viable alternative to Si-based power devices in high-efficiency and high-power density applications. SiC devices have numerous persuasive advantages--high-breakdown voltage, high-operating electric field, high-operating temperature, high-switching frequency and low losses. Silicon Carbide (SiC) devices belong to the so-called wide band gap semiconductor group, which offers a number of attractive characteristics for high voltage power semiconductors when compared to commonly used silicon (Si). Recently, some SiC power devices, for example, Schottky-barrier diodes (SBDs),

metal-oxide-semiconductor field-effect transistors (MOSFETs), junction FETs (JFETs), and their integrated modules have come onto the market. Physics and Technology of Silicon Carbide Devices abundantly describes recent technologies on manufacturing, processing, characterization, modeling, etc. for SiC devices.

This book gathers the latest research, innovations, and applications in the field of civil engineering, as presented by leading national and international academics, researchers, engineers, and postgraduate students at the AWAM International Conference on Civil Engineering 2019 (AICCE'19), held in Penang, Malaysia on August 21-22, 2019. The book covers highly diverse topics in the main fields of civil engineering, including structural and earthquake engineering, environmental engineering, geotechnical engineering, highway and transportation engineering, water resources engineering, and geomatic and construction management. In line with the conference theme, "Transforming the Nation for a Sustainable Tomorrow", which relates to the United Nations' 17 Global Goals for Sustainable Development, it highlights important elements in the planning and development stages to establish design standards beneficial to the environment and its surroundings. The contributions introduce numerous exciting ideas that spur novel research directions and foster multidisciplinary collaborations between various specialists in the field of civil engineering.

*Esthetics and Biomechanics in Orthodontics, 2nd Edition* provides everything you need to know to successfully apply biomechanics in clinical orthodontics. This edition features new content in the areas of tooth movement, treating Class III malocclusions, skeletal anchorage, Surgery First treatment plans, and space closure.

In addition to comprehensive guidance on basic biomechanical principles, this state-of-the-art reference also shows how all techniques can apply biomechanical principles to improve the force delivery, understand and prevent side effects, and achieve predictable results. Highly regarded lead author, Dr. Ravindra Nanda, is a widely known and respected educator in the field of orthodontics. Comprehensive coverage of diagnosis, treatment planning, and esthetics in tooth display provides a solid foundation in orthodontia and biomechanic problem solving. Case reports include high-quality photographs, radiographs, and illustrations to better show biomechanical principles. Radiographs and line drawings accompany clinical photographs to help illustrate the various stages of treatment. NEW! Content on the fundamentals that guide orthodontic tooth movement offers a clear understanding of how orthodontic appliances work and their role in designing treatment methodologies. NEW! Content on procedures and indications for optimal space closure helps you define priorities in treatment planning and understand all the treatment alternatives. NEW! Detailed information on biomechanics-based management of impacted canines provides treatment planning strategies and biomechanic techniques to achieve desired results without increasing treatment time. NEW! Coverage on modalities for the treatment of Class III malocclusions offers insight into new treatment protocols — such as corticotomy-assisted facemask therapy and corticotomy-assisted maxillary protraction — that are available to effectively treat these occurrences. NEW! Detailed information on the different forms of skeletal anchorage (including mini-implant technology) shows how certain challenges associated with types of tooth movement can now be overcome by apply-

ing sound biomechanical principles to skeletal anchorage. NEW! In-depth coverage of the Surgery First (SF) treatment plan offers step-by-step examples to help explain the technique of Sendai SF and its benefits

The Handbook of Advanced Lighting Technology is a major reference work on the subject of light source science and technology, with particular focus on solid-state light sources – LEDs and OLEDs – and the development of 'smart' or 'intelligent' lighting systems; and the integration of advanced light sources, sensors, and adaptive control architectures to provide tailored illumination which is 'fit to purpose.' The concept of smart lighting goes hand-in-hand with the development of solid-state light sources, which offer levels of control not previously available with conventional lighting systems. This has impact not only at the scale of the individual user, but also at an environmental and wider economic level. These advances have enabled and motivated significant research activity on the human factors of lighting, particularly related to the impact of lighting on healthcare and education, and the Handbook provides detailed reviews of work in these areas. The potential applications for smart lighting span the entire spectrum of technology, from domestic and commercial lighting, to breakthroughs in biotechnology, transportation, and light-based wireless communication. Whilst most current research globally is in the field of solid-state lighting, there is renewed interest in the development of conventional and non-conventional light sources for specific applications. This Handbook comprehensively reviews the basic physical principles and device technologies behind all light source types and includes discussion of the state-of-the-art. The book essentially breaks down into five major sections: Section 1:

The physics, materials, and device technology of established, conventional, and emerging light sources, Section 2: The science and technology of solid-state (LED and OLED) light sources, Section 3: Driving, sensing and control, and the integration of these different technologies under the concept of smart lighting, Section 4: Human factors and applications, Section 5: Environmental and economic factors and implications

As we know, rapid industrialization is a serious concern in the context of a healthy environment and public health due to the generation of huge volumes of toxic wastewater. Although various physico-chemical and biological approaches are available for the treatment of this wastewater, many of them are not effective.

Now, there a number of emerging ecofriendly, cost-effective approaches utilizing microorganisms (bacterial/fungi/algae), green plants or their enzymes, and constructed wetland treatment systems in the treatment of wastewaters containing pollutants such as endocrine disrupting chemicals, toxic metals, pesticides, dyes, petroleum hydrocarbons and phenolic compounds. This book provides a much-needed, comprehensive overview of the various types of wastewater and their ecotoxicological effects on the environment, humans, animals and plants as well as various emerging and eco-friendly approaches for their treatment. It provides insights into the ecological problems and challenges in the treatment and management of wastewaters generated by various sources.