

Minnesota Micromotors Simulation Strategy Solution

From award-winning investigative journalist Kyle Swenson, *Good Kids, Bad City* is the true story of the longest wrongful imprisonment in the United States to end in exoneration, and a critical social and political history of Cleveland, the city that convicted them. In the early 1970s, three African-American men—Wiley Bridgeman, Kwame Ajamu, and Rickey Jackson—were accused and convicted of the brutal robbery and murder of a man outside of a convenience store in Cleveland, Ohio. The prosecution's case, which resulted in a combined 106 years in prison for the three men, rested on the more-than-questionable testimony of a pre-teen, Ed Vernon. The actual murderer was never found. Almost four decades later, Vernon recanted his testimony, and Wiley, Kwame, and Rickey were released. But while their exoneration may have ended one of American history's most disgraceful miscarriages of justice, the corruption and decay of the city responsible for their imprisonment remain on trial. Interweaving the dramatic details of the case with Cleveland's history—one that, to this day, is fraught with systemic discrimination and racial tension—Swenson reveals how this outrage occurred and why. *Good Kids, Bad City* is a work of astonishing empathy and insight: an immersive exploration of race in America, the struggling Midwest, and how lost lives can be recovered.

Research into and development of high-precision systems, microelectromechanical systems, distributed sensors/actuators, smart structural systems, high-precision controls, etc. have drawn much attention in recent years. These new devices and systems will bring about a new technical revolution in modern industries and impact future human life. This book presents a unique overview of these technologies such as silicon based sensors/actuators and control piezoelectric micro sensors/actuators, micro actuation and control, micro sensor applications in robot control, optical fiber sensors/systems, etc. These are four essential subjects emphasized in the book: 1. Survey of the (current) research and development; 2. Fundamental theories and tools; 3. Practical applications. 4. Outlining future research and development.

This hearing on "China's Advanced Weapons" will examine a specific set of technologies that China's military is considering or pursuing. In framing the hearing topic as "advanced weapons," the hearing will focus on military technologies at or near the global technological frontier—weapons just now coming into development or not yet developed by any nation. As China has narrowed the technological gap with the United States over decades of investments in military modernization, it has become increasingly important to consider Beijing's efforts to develop new and potentially revolutionary weapons systems. China has reportedly conducted seven tests of its hypersonic glide vehicle since 2014. It has deployed not one but two antiship ballistic missiles, one of which has a stated range that reaches past the U.S. island of Guam. We hear of longstanding efforts to develop directed energy weapons, and see evidence of China testing a wide range of counterspace systems that could put vulnerable U.S. space assets at risk. China is making major advances in areas such as unmanned systems and artificial intelligence, aided by rapid commercial progress in these sectors. As the new Congress focuses on national security challenges, it is critical to consider China's efforts to develop and field advanced weapons and the implications for the United States. Panel I will examine China's programs for the development of hypersonic and maneuverable re-entry vehicles. Panel II will examine directed energy and electromagnetic weapons development by China. Finally, Panel III will examine developments in China's counterspace, unmanned, and artificial intelligence-enabled systems.

For courses in sales management. *Sales Management, 1/e* is the only book on the market that prepares students to become effective sales managers in today's hyper-competitive, global economy—by integrating current technology, research, and strategic thinking activities.

A snapshot of the central ideas used to control fracture properties of engineered structural metallic materials, *Advanced Structural Materials: Properties, Design Optimization, and Applications* illustrates the critical role that advanced structural metallic materials play in aerospace, biomedical, automotive, sporting goods, and other industries in the twenty-first century. The book presents an overview of the structure, properties, and applications of these materials, including the basic ideas behind their design. It contains examples and accessible language, elucidating the basic concepts that guide the development of new alloys and composite materials. With in-depth reviews from leading contributors, the text develops an understanding of the breadth and depth of advances in the field. It begins with a broad introduction to advanced structural materials, then examines materials at the frontiers of emerging applications such as biomaterials, MEMS, amorphous materials, and nanotechnology. The chapter authors are experts in their own right and they assume no prior knowledge of a given material system, delineating the fundamental concepts and applications of advanced structural materials. The rich array of carefully selected topics provides useful insights into the structure, properties, and applications of advanced structural materials.

This book is designed to offer a comprehensive high-level introduction to transhumanism, an international political and cultural movement that aims to produce a "paradigm shift" in our ethical and political understanding of human evolution. Transhumanist thinkers want the human species to take the course of evolution into its own hands, using advanced technologies currently under development – such as robotics, artificial intelligence, biotechnology, cognitive neurosciences, and nanotechnology – to overcome our present physical and mental limitations, improve our intelligence beyond the current maximum achievable level, acquire skills that are currently the preserve of other species, abolish involuntary aging and death, and ultimately achieve a post-human level of existence. The book covers transhumanism from a historical, philosophical, and scientific viewpoint, tracing its cultural roots, discussing the main philosophical, epistemological, and ethical issues, and reviewing the state of the art in scientific research on the topics of most interest to transhumanists. The writing style is clear and accessible for the general reader, but the book will also appeal to graduate and undergraduate students.

energy production, environmental management, transportation, communication, computation, and education. As the twenty-first century unfolds, nanotechnology's impact on the health, wealth, and security of the world's people is expected to be at least as significant as the combined influences in this century of antibiotics, the integrated circuit, and human-made polymers. Dr. Neal Lane, Advisor to the President for Science and Technology and former National Science Foundation (NSF) director, stated at a Congressional hearing in April 1998, "If I were asked for an area of science and engineering that will most likely produce the breakthroughs of tomorrow, I would point to nanoscale science and engineering." Recognizing this potential, the White House Office of Science and Technology Policy (OSTP) and the Office of Management and Budget (OMB) have issued a joint memorandum to Federal agency heads that identifies nanotechnology as a research priority area for Federal investment in fiscal year 2001. This report charts "Nanotechnology Research Directions," as developed by the Interagency Working Group on Nano Science, Engineering, and Technology (IWGN) of the National Science and Technology Council (NSTC). The report incorporates the views of leading experts from government, academia, and the private sector. It reflects the consensus reached at an IWGN-sponsored workshop held on January 27-29, 1999, and detailed in contributions submitted thereafter by members of the U. S. science and engineering community. (See Appendix A for a list of contributors.

"The Human Hand as an Inspiration for Robot Hand Development" presents an edited collection of authoritative contributions in the area of robot hands. The results described in the volume are expected to lead to more robust, dependable, and inexpensive distributed systems such as those endowed with complex and advanced sensing, actuation, computation, and communication capabilities. The twenty-four chapters discuss the field of robotic grasping and manipulation viewed in light of the human hand's capabilities and push the state-of-the-art in robot hand design and control. Topics discussed include human hand biomechanics, neural control, sensory feedback and perception, and robotic grasp and manipulation. This book will be useful for researchers from diverse areas such as robotics, biomechanics, neuroscience, and anthropologists.

This book describes how surface tension effects can be used by engineers to provide mechanical functions in miniaturized products (1 mm). Even if precursors of this field such as Jurin or Laplace already date back to the 18th century, describing surface tension effects from a mechanical perspective is very recent. The originality of this book is to consider the effects of capillary bridges on solids, including forces and torques exerted both statically and dynamically by the liquid along the 6 degrees-of-freedom. It provides a comprehensive approach to various applications, such as capillary adhesion (axial force), centering force in packaging and micro-assembly (lateral force) and recent developments such as a capillary motor (torque).

are convinced that SIMPAR has succeeded in giving a first answer to this search, and it can be followed by proper scientific and engineering actions in the near future.

Nanorobots can be defined as intelligent systems with overall dimensions at or below the micrometer range that are made of assemblies of nanoscale components with individual dimensions ranging between 1 to 100 nm. These devices can now perform a wide variety of tasks at the nanoscale in a wide variety of fields including but not limited to fields such as manufacturing, medicine, supply chain, biology, and aerospace. Nanorobotics: Current Approaches and Techniques offers a comprehensive overview of this emerging interdisciplinary field with a wide ranging discussion that includes nanomanipulation and industrial nanorobotics, nanorobotic manipulation in biology and medicine, nanorobotic sensing, navigation and swarm behavior and CNT, and protein and DNA-based nanorobotics.

For a sophomore-level course in Linear Algebra. Based on the recommendations of the Linear Algebra Curriculum Study Group, this introduction to linear algebra offers a matrix-oriented approach with more emphasis on problem solving and applications. Throughout the text, use of technology is encouraged. The focus is on matrix arithmetic, systems of linear equations, properties of Euclidean n-space, eigenvalues and eigenvectors, and orthogonality. Although matrix-oriented, the text provides a solid coverage of vector spaces.

Biophysical chemistry is one of the most interesting interdisciplinary research fields. Some of its different subjects have been intensively studied for decades. Now the field attracts not only scientists from chemistry, physics, and biology backgrounds but also those from medicine, pharmacy, and other sciences. We aimed to start this version of the book Biophysical Chemistry from advanced principles, as we include some of the most advanced subject matter, such as advanced topics in catalysis applications (first section) and therapeutic applications (second section). This led us to limit our selection to only chapters with high standards, therefore there are only six chapters, divided into two sections. We have assumed that the interested readers are familiar with the fundamentals of some advanced topics in mathematics such as integration, differentiation, and calculus and have some knowledge of organic and physical chemistry, biology, and pharmacy. We hope that the book will be valuable to graduate and postdoctoral students with the requisite background, and by some advanced researchers active in chemistry, biology, biochemistry, medicine, pharmacy, and other sciences.

Excellent teaching and resource material . . . it is concise, coherently structured, and easy to read . . . highly recommended for students, engineers, and researchers in all related fields." -Corrosion on the First Edition of Fundamentals of Electrochemical Deposition From computer hardware to automobiles, medical diagnostics to aerospace, electrochemical deposition plays a crucial role in an array of key industries. Fundamentals of Electrochemical Deposition, Second Edition is a comprehensive introduction to one of today's most exciting and rapidly evolving fields of practical knowledge. The most authoritative introduction to the field so far, the book presents detailed coverage of the full range of electrochemical deposition processes and technologies, including: * Metal-solution interphase * Charge transfer across an interphase * Formation of an equilibrium electrode potential * Nucleation and growth of thin films * Kinetics and mechanisms of electrodeposition * Electroless deposition * In situ characterization of deposition processes * Structure

and properties of deposits * Multilayered and composite thin films * Interdiffusion in thin film * Applications in the semiconductor industry and the field of medicine This new edition updates the prior edition to address the new developments in the science and its applications, with new chapters on innovative applications of electrochemical deposition in semiconductor technology, magnetism and microelectronics, and medical instrumentation. Added coverage includes such topics as binding energy, nanoclusters, atomic force, and scanning tunneling microscopy. Example problems at the end of chapters and other features clarify and improve understanding of the material. Written by an author team with extensive experience in both industry and academe, this reference and text provides a well-rounded introduction to the field for students, as well as a means for professional chemists, engineers, and technicians to expand and sharpen their skills in using the technology.

This book tells 101 stories of company efforts to implement the many aspects of flow manufacturing -- including such topics as just-in-time production, total quality control, reorganization of factories into product-focused or customer-focused cells, plants-in-a-plant, material flows by the simplicity of visual kanban, supplier partnerships, quick setup of equipment, cross-training and job rotation of the work force, and many more. The 101 mini-case studies -- dubbed "caselets" -- include 26 non-U.S. companies from 12 countries and cover a wide swath of industrial sectors, and include many well-known corporations such as Apple, Campbell Soup, Honeywell, and Boeing. From the 1980s to the present, the author has been taking the message of process improvement and customer-focused excellence far and wide. Most of these travels, usually in connection with delivering a seminar, include brief factory tours in which he compiled detailed notes and then organized them as brief reports -- his unvarnished analysis or take on what they do well and what needs improvement. In the main the reports were then sent back to the hosts of the plant tour. These factory tours and these follow-up reports form the basis of the large majority of this book's caselets. Many of the caselets bring to life process-improvement methodologies in detail. With lots of caselets to draw from, the readers will find vivid examples of similar companies and processes within their respective industries. For example, the caselets often include applications of advanced concepts in cost management, employee training, performance management, supply chains, and logistics as well as applications of plant layout, quick setup, material handling, quality assurance, scheduling, ergonomics, and flow analysis.

A representative cross-section of elastic biomolecules is covered in this volume, which combines seventeen contributions from leading research groups. State-of-the-art molecular mechanics experiments are described dealing with the elasticity of DNA and nucleoprotein complexes, titin and titin-like proteins in muscle, as well as proteins of the cytoskeleton and the extracellular matrix. The book speaks particularly to cell biologists, biophysicists, or bioengineers, and to senior researchers and graduate students alike, who are interested in recent advances in single-molecule technology (optical tweezers technique, atomic force microscopy), EM imaging, and computer simulation approaches to study nanobiomechanics. The findings discussed here have redefined our view of the role mechanical signals play in cellular functions and have greatly helped improve our understanding of biological elasticity in general.

Change is the one constant in business, and we must adapt or face obsolescence. Yet certain challenges never go away. That's what makes this book "must read." These are the 10 seminal articles by management's most influential experts, on topics of perennial concern to ambitious managers and leaders hungry for inspiration--and ready to run with big ideas to accelerate their own and their companies' success. If you read nothing else - full stop - read: Michael Porter on creating competitive advantage and distinguishing your company from rivals John Kotter on leading change through eight critical stages Daniel Goleman on using emotional intelligence to maximize performance Peter Drucker on managing your career by evaluating your own strengths and weaknesses Clay Christensen on orchestrating innovation within established organizations Tom Davenport on using analytics to determine how to keep your customers loyal Robert Kaplan and David Norton on measuring your company's strategy with the Balanced Scorecard Rosabeth Moss Kanter on avoiding common mistakes when pushing innovation forward Ted Levitt on understanding who your customers are and what they really want C. K. Prahalad and Gary Hamel on identifying the unique, integrated systems that support your strategy

A powerful call to action, *Customer Centricity* upends some of our most fundamental beliefs about customer service, customer relationship management, and customer lifetime value. Despite what the old adage says, the customer is not always right. Even companies that can seemingly do no wrong—like the coffeehouse giant Starbucks—have only recently started to figure this out. Starbucks is one of many companies that has successfully executed a pivot that puts the company in a customer-centric mindset, an approach that Wharton professor Peter Fader describes in *Customer Centricity*. Fader advocates that in the world of customer centricity, there are good customers ... and then there is pretty much everybody else. In a new preface and afterword to *Customer Centricity*, Fader reflects on how the landscape has changed over nearly a decade since he first proposed that businesses radically rethink how they relate to customers. Using examples from Starbucks, Nordstrom, and more, Fader provides insights to help you understand: Why customer centricity is the new model for success in today's data-driven environment. How the ideas of brand equity and customer asset value help us understand what kinds of companies naturally lend themselves to the customer-centric model and which ones don't; Why the traditional models for determining the value of individual customers are flawed; How executives can use customer lifetime value (CLV) and other customer-centric data to make smarter decisions about their companies; How the well-intended idea of customer relationship management (CRM) lost its way—and how your company can properly put CRM to use; How customer centricity will help you realign your performance metrics, product development, customer relationship management and organization to make sure you focus directly on the needs of your most valuable customers and increase profits for the long term. ALSO AVAILABLE: Once Fader convinces you of the value of customer centricity in this book, *The Customer Centricity Playbook*, with Sarah Toms, will show you where to get started to bring it to the forefront of your organization. THE WHARTON EXECUTIVE ESSENTIALS SERIES The Wharton Executive Essentials series from Wharton School Press brings the ideas of the Wharton School's thought leaders to you wherever you are. Inspired by Wharton's Executive Education program, each book is authored by globally renowned faculty and filled with real-life business examples and actionable advice. Wharton Executive Essentials guides offer a quick-reading, penetrating, and comprehensive summary of the knowledge

leaders need to excel in today's competitive business environment and capture tomorrow's opportunities.

DIVComprehensive treatment offers 115 solved problems and exercises to promote understanding of vector and tensor theory, basic kinematics, balance laws, field equations, jump conditions, and constitutive equations. /div

As our knowledge of microelectromechanical systems (MEMS) continues to grow, so does The MEMS Handbook. The field has changed so much that this Second Edition is now available in three volumes. Individually, each volume provides focused, authoritative treatment of specific areas of interest. Together, they comprise the most comprehensive collection of MEMS knowledge available, packaged in an attractive slipcase and offered at a substantial savings. This best-selling handbook is now more convenient than ever, and its coverage is unparalleled. The third volume, MEMS: Applications, offers a broad overview of current, emerging, and possible future MEMS applications. It surveys inertial sensors, micromachined pressure sensors, surface micromachined devices, microscale vacuum pumps, reactive control for skin-friction reduction, and microchannel heat sinks, among many others. Two new chapters discuss microactuators and nonlinear electrokinetic devices. This book is vital to understanding the current and possible capabilities of MEMS technologies. MEMS: Applications comprises contributions from the foremost experts in their respective specialties from around the world. Acclaimed author and expert Mohamed Gad-el-Hak has again raised the bar to set a new standard for excellence and authority in the fledgling fields of MEMS and nanotechnology. The perfect gift for aspiring leaders: 16 volumes of HBR 20-Minute Manager. This 16-volume, specially priced boxed set makes a perfect gift for aspiring leaders who are short on time but need advice fast, on topics from creating business plans and giving feedback to managing time and presentations. The set includes Creating Business Plans, Delegating Work, Difficult Conversations, Finance Basics, Getting Work Done, Giving Effective Feedback, Innovative Teams, Leading Virtual Teams, Managing Projects, Managing Time, Managing Up, Performance Reviews, Presentations, Running Meetings, Running Virtual Meetings, and Virtual Collaboration. Don't have much time? Get up to speed fast on the most essential business skills with HBR's 20-Minute Manager series. Whether you need a crash course or a brief refresher, each book in the series is a concise, practical primer that will help you brush up on a key management topic. Advice you can quickly read and apply, for ambitious professionals and aspiring executives--from the most trusted source in business. Also available as an ebook.

Customer CentricityFocus on the Right Customers for Strategic AdvantageUniversity of Pennsylvania Press

The information revolution--which is as much an organizational as a technological revolution--is transforming the nature of conflict across the spectrum: from open warfare, to terrorism, crime, and even radical social activism. The era of massed field armies is passing, because the new information and communications systems are increasing the lethality of quite small units that can call in deadly, precise missile fire almost anywhere, anytime. In social conflicts, the Internet and other media are greatly empowering individuals and small groups to influence the behavior of states. Whether in military or social conflicts, all protagonists will soon be developing new doctrines, strategies, and tactics for swarming their opponents--with weapons or words, as circumstances require. Preparing for conflict in such a world will require shifting to new forms of organization, particularly the versatile, hardy, all-channel network. This shift will prove difficult for states and professional militaries that remain bastions of hierarchy, bound to resist institutional redesign. They will make the shift as they realize that information and knowledge are becoming the key elements of power. This implies, among other things, that Mars, the old brute-force god of war, must give way to Athena, the well-armed goddess of wisdom. Accepting Athena as the patroness of this information age represents a first step not only for preparing for future conflicts, but also for preventing them.

Medical devices and surgical tools that contain micro and nanoscale features allow surgeons to perform clinical procedures with greater precision and safety while monitoring physiological and biomechanical parameters more accurately. While surgeons have started to master the use of nanostructured surgical tools in the operating room, this book addresses for the first time the impact and interaction of nanomaterials and nanostructured coatings in a comprehensive manner. Surface Engineered Surgical Tools and Medical Devices presents the latest information and techniques in the emerging field of surface engineered biomedical devices and surgical tools, and analyzes the interaction between nanotechnology, nanomaterials, and tools for surgical applications. Chapters of the book describe developments in coatings for heart valves, stents, hip and knee joints, cardiovascular devices, orthodontic applications, and regenerative materials such as bone substitutes. Chapters are also dedicated to the performance of surgical tools and dental tools and describe how nanostructured surfaces can be created for the purposes of improving cell adhesion between medical devices and the human body.

This book provides a comprehensive summary of the status of emerging sensor technologies and provides a framework for future advances in the field. Chemical sensors have gained in importance in the past decade for applications that include homeland security, medical and environmental monitoring and also food safety. A desirable goal is the ability to simultaneously analyze a wide variety of environmental and biological gases and liquids in the field and to be able to selectively detect a target analyte with high specificity and sensitivity. The goal is to realize real-time, portable and inexpensive chemical and biological sensors and to use these as monitors for handheld gas, environmental pollutant, exhaled breath, saliva, urine, or blood, with wireless capability. In the medical area, frequent screening can catch the early development of diseases, reduce the suffering of patients due to late diagnoses, and lower the medical cost. For example, a 96% survival rate has been predicted in breast cancer patients if the frequency of screening is every three months. This frequency cannot be achieved with current methods of mammography due to high cost to the patient and invasiveness (radiation). In the area of detection of medical biomarkers, many different methods, including enzyme-linked immunosorbent assay (ELISA), particle-based flow cytometric assays, electrochemical measurements based on impedance and capacitance, electrical measurement of microcantilever resonant frequency change, and conductance measurement of semiconductor nanostructures, gas chromatography (GC), ion chromatography, high density peptide arrays, laser scanning quantitative analysis, chemiluminescence, selected ion flow tube (SIFT), nanomechanical cantilevers, bead-based suspension microarrays, magnetic biosensors and mass spectrometry (MS) have been employed. Depending on the sample condition, these methods may show variable results in terms of sensitivity for some applications and may not meet the requirements for a handheld biosensor.

The application of Micro Electro Mechanical Systems (MEMS) in the biomedical field is leading to a new generation of medical devices. MEMS for biomedical applications reviews the wealth of recent research on fabrication technologies and applications of this exciting technology. The book is divided into four parts: Part one introduces the fundamentals of MEMS for biomedical applications, exploring the microfabrication of polymers and reviewing sensor and actuator mechanisms. Part two describes applications of MEMS for biomedical sensing and diagnostic applications. MEMS for in vivo sensing and electrical impedance

spectroscopy are investigated, along with ultrasonic transducers, and lab-on-chip devices. MEMS for tissue engineering and clinical applications are the focus of part three, which considers cell culture and tissue scaffolding devices, BioMEMS for drug delivery and minimally invasive medical procedures. Finally, part four reviews emerging biomedical applications of MEMS, from implantable neuroprobes and ocular implants to cellular microinjection and hybrid MEMS. With its distinguished editors and international team of expert contributors, MEMS for biomedical applications provides an authoritative review for scientists and manufacturers involved in the design and development of medical devices as well as clinicians using this important technology. Reviews the wealth of recent research on fabrication technologies and applications of Micro Electro Mechanical Systems (MEMS) in the biomedical field Introduces the fundamentals of MEMS for biomedical applications, exploring the microfabrication of polymers and reviewing sensor and actuator mechanisms Considers MEMS for biomedical sensing and diagnostic applications, along with MEMS for in vivo sensing and electrical impedance spectroscopy

The Information Age: An Anthology on Its Impacts and Consequences was originally prepared by The Center for Advanced Concepts, Technologies, and Information Strategies of the Institute for National Strategic Studies, National Defense University. The original four volumes have been combined into one volume for this printing. They are: Part One: The Information and Communication Revolution Part Two: Business, Commerce, and Services Part Three: Government and the Military Part Four: International Affairs

Bicontinuous interfacially jammed emulsion gels, now commonly termed 'bijels', are a class of soft materials, in which interpenetrating, continuous domains of two immiscible fluids are maintained in a rigid arrangement by a jammed layer of colloidal particles at their interface. Such gels have unusual material properties that promise exciting applications across diverse fields from energy materials and catalysis, to food science. This is the first book on the subject and provides the reader with a fundamental introduction. Edited by a recognised authority on bijels, the reader will learn about the bijel and its formation. Bringing together current understanding, this book aims to bring the potential application of bijels to diverse materials challenges closer to fruition. This is a must-have resource for anyone working in soft matter and applied fields.

This updated volume provides a comprehensive guide to the recent developments of digital and intelligent technologies related to genitourinary surgery. New topics include the adaptation of simulators, training programs, standardized credentialing, evidence-based practice, as well as the economics of robotic surgery. The impact on public and global health is also covered. Robotics in Genitourinary Surgery aims to help surgeons and patients adopt the techniques and procedures discussed, and in turn educate and expand research activities within the field.

This international technology assessment study has focused on the emerging global trend toward the miniaturization of manufacturing processes, equipment and systems for microscale components and products. The study has investigated both the state-of-the-art as well as emerging technologies from the scientific, technological, and commercialization perspectives across key industrial sectors in the USA, Asia and Europe.

This book constitutes the refereed proceedings of the 24th International Conference on Computer Safety, Reliability, and Security, SAFECOMP 2005, held in Fredrikstad, Norway, in September 2005. The 30 revised full papers were carefully reviewed and selected for inclusion in the book. The papers address all aspects of dependability and survivability of critical computerized systems in various branches and infrastructures.

This text provides a comprehensive and contemporary discussion of current indications, techniques, technology, and results in ureteroscopy from the world leaders who perform this procedure. It provides not only the latest literature and data regarding URS but also tips and tricks for the reader when performing various URS procedures. Historical prospective will link the reader with the past and provide insight as to why we have evolved into a minimally invasive specialty. Technological advancements of both flexible and rigid ureteroscopic procedures are included to provide the reader with many practical considerations when choosing this modality for their patients. Renowned experts in the field discuss the myriad of supplemental devices that accompany URS and how best to utilize them in one's practice. Unique to this predominantly clinical text, are sections on simulation and the socioeconomics of URS that demonstrate how the student can learn and acquire techniques and skills of their own. Ureteroscopy: A Comprehensive Contemporary Guide provides its readers with a thorough and complete representation of the current state of URS and its applications and guide those interested in improving their techniques, armamentarium and horizons in this ever-changing world of minimally invasive urology.

Micromanufacturing and Nanotechnology is an emerging technological infrastructure and process that involves manufacturing of products and systems at the micro and nano scale levels. Development of micro and nano scale products and systems are underway due to the reason that they are faster, accurate and less expensive. Moreover, the basic functional units of such systems possesses remarkable mechanical, electronic and chemical properties compared to the macro-scale counterparts. Since this infrastructure has already become the preferred choice for the design and development of next generation products and systems it is now necessary to disseminate the conceptual and practical phenomenological know-how in a broader context. This book incorporates a selection of research and development papers. Its scope is the history and background, underlying design methodology, application domains and recent developments.

Mechatronics has evolved into a way of life in engineering practice, and it pervades virtually every aspect of the modern world. In chapters drawn from the bestselling and now standard engineering reference, The Mechatronics Handbook, this book introduces the vibrant field of mechatronics and its key elements: physical system modeling; sensors and actuators; signals and systems; computers and logic systems; and software and data acquisition. These chapters, written by leading academics and practitioners, were carefully selected and organized to provide an accessible, general outline of the subject ideal for non-specialists.

Mechatronics: An Introduction first defines and organizes the key elements of mechatronics, exploring design approach, system interfacing, instrumentation, control systems, and microprocessor-based controllers and microelectronics. It then surveys physical system modeling, introducing MEMS along with modeling and simulation. Coverage then moves to essential elements of sensors and actuators, including characteristics and fundamentals of time and frequency, followed by control systems and subsystems, computer hardware, logic, system interfaces, communication and computer networking, data acquisition, and computer-based instrumentation systems. Clear explanations and nearly 200 illustrations help bring the subject to life. Providing a broad overview of the fundamental aspects of the field, Mechatronics: An Introduction is an ideal primer for those new to the field, a handy review for those already familiar with the technology, and a friendly introduction for anyone who is curious about mechatronics.

The first comprehensive reference on mechatronics, The Mechatronics Handbook was quickly embraced as the gold standard in

the field. From washing machines, to coffeemakers, to cell phones, to the ubiquitous PC in almost every household, what, these days, doesn't take advantage of mechatronics in its design and function? In the scant five years since the initial publication of the handbook, the latest generation of smart products has made this even more obvious. Too much material to cover in a single volume Originally a single-volume reference, the handbook has grown along with the field. The need for easy access to new material on rapid changes in technology, especially in computers and software, has made the single volume format unwieldy. The second edition is offered as two easily digestible books, making the material not only more accessible, but also more focused. Completely revised and updated, Robert Bishop's seminal work is still the most exhaustive, state-of-the-art treatment of the field available.

This book showcases cutting-edge research papers from the 5th International Conference on Research into Design – the largest in India in this area – written by eminent researchers from across the world on design process, technologies, methods and tools, and their impact on innovation, for supporting design across boundaries. The special features of the book are the variety of insights into the product and system innovation process, and the host of methods and tools from all major areas of design research for the enhancement of the innovation process. The main benefit of the book for researchers in various areas of design and innovation are access to the latest quality research in this area, with the largest collection of research from India. For practitioners and educators, it is exposure to an empirically validated suite of theories, models, methods and tools that can be taught and practiced for design-led innovation.

An application of differential forms for the study of some local and global aspects of the differential geometry of surfaces. Differential forms are introduced in a simple way that will make them attractive to "users" of mathematics. A brief and elementary introduction to differentiable manifolds is given so that the main theorem, namely Stokes' theorem, can be presented in its natural setting. The applications consist in developing the method of moving frames expounded by E. Cartan to study the local differential geometry of immersed surfaces in R^3 as well as the intrinsic geometry of surfaces. This is then collated in the last chapter to present Chern's proof of the Gauss-Bonnet theorem for compact surfaces.

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