This book describes the growing field of multi-criteria decision making (MCDM) as applied to materials selection in product design. Useful in academic and research contexts, as well as to practitioners in materials engineering and design, it aids readers in producing successful designs by improving the decision-making process in materials selection. It is a constant challenge for designers, even when educated in the fundamentals of materials and mechanical engineering, to select the best materials to satisfy complex design problems. Current approaches to materials selection range from the use of intuition and experience to computer-based methods including electronic databases and search engines. Increasingly, MCDM methods are proving effective in materials selection for complex design problems. These methods supplement existing quantitative methods, such as selection charts, by allowing simultaneous consideration of design attributes, component configurations and types of material. Discusses the rationale for optimal materials selection in the context of achieving the best engineering design. Describes methodologies for supporting enhanced decision-making in materials selection includes end-of-chapter review questions and practical case studies from biomedical and aerospace engineering applications.

This superb study offers insights into the methods and techniques that enable the implementation of a Collaborative Engineering concept on product design. It does so by integrating capabilities for intelligent information support and group decision-making, utilizing a common enterprise network model and knowledge interface through shared ontologies. The book is also a collection of the latest applied methods and technology from selected experts in this area.

This book constitutes the refereed proceedings of the 4th International Conference on Recent Developments in Science, Engineering and Technology, REDSET 2017, held in Gurgaon, India, in October 2017. The 66 revised full papers presented were carefully reviewed and selected from 329 submissions. The papers are organized in topical sections on big data analysis, data centric programming, next generation computing, social and web analytics, security in data science analytics.
This book provides a basic understanding of adaptive control and its applications in Flight control. It discusses the designing of an adaptive feedback control system and analyzes this for flight control of linear and nonlinear aircraft models using synthetic jet actuators. It also discusses control methodologies and the application of control techniques which will help practicing flight control and active flow control researchers. It also covers modelling and control designs which will also benefit researchers from the background of fluid mechanics and health management of actuation systems. The unique feature of this book is characterization of synthetic jet actuator nonlinearities over a wide range of angles of attack, an adaptive compensation scheme for such nonlinearities, and a systematic framework for feedback control of aircraft dynamics with synthetic jet actuators.
This book functions as a practical guide for the use of simulation in anesthesiology. Divided into five parts, it begins with the history of simulation in anesthesiology, its relevant pedagogical principles, and the modes of its employment. Readers are then provided with a comprehensive review of simulation technologies as employed in anesthesiology and are guided on the use of simulation for a variety of learners: undergraduate and graduate medical trainees, practicing anesthesiologists, and allied health providers. Subsequent chapters provide a "how-to" guide for the employment of simulation across wide range of anesthesiology subspecialties before concluding with a proposed roadmap for the future of translational simulation in healthcare. The Comprehensive Textbook of Healthcare Simulation: Anesthesiology is written and edited by leaders in the field and includes hundreds of high-quality color surgical illustrations and photographs.

Issues in Materials and Manufacturing Research: 2012 Edition is a ScholarlyEditionsTM eBook that delivers timely, authoritative, and comprehensive information about Molecular Modeling. The editors have built Issues in Materials and Manufacturing Research: 2012 Edition on the vast information databases of ScholarlyNews™. You can expect the information about Molecular Modeling in this eBook to be deeper than what you can access anywhere else, as well as consistently reliable, authoritative, informed, and relevant. The content of Issues in Materials and Manufacturing Research: 2012 Edition has been produced by the world's leading scientists, engineers, analysts, research institutions, and companies. All of the content is from peer-reviewed sources, and all of it is written, assembled, and edited by the editors at ScholarlyEditions™ and available exclusively from us. You now have a source that can cite with authority, confidence, and credibility. More information is available at http://www.ScholarlyEditions.com/.

Teaching project management is not an easy task. Part of the difficulty is the one-of-a-kind nature of projects. This book and the software that comes with it (Project Team Builder) present a unique approach to the teaching and training of project management — an approach based on a software tool that combines an interactive, dynamic case study and a simple yet effective Project Management System. The book focuses on problems that the project manager faces in planning, monitoring and controlling projects. Together with the software, the book provides the user with the opportunity to experience complex Project Management situations, understand the situation, develop alternative ways to cope with it and select the best alternative based on rigorous analysis. Project Team Builder (PTB), the software that accompanies this book, is web-based, please visit http://www.sandboxmodel.com.

This book discusses reliability applications for power systems, renewable energy and smart grids and highlights trends in reliable communication, fault-tolerant systems, VLSI system design and embedded systems. Further, it includes chapters on software reliability and other computer engineering and software management-related disciplines, and also examines areas such as big data analytics and ubiquitous computing. Outlining novel, innovative concepts in applied areas of reliability in electrical, electronics and computer engineering disciplines, it is a valuable resource for researchers and practitioners of reliability theory in circuit-based engineering domains.

As a result of the recent advances in the computation and communications industries, wireless communications-enabled computing devices are ubiquitous nowadays. Even though these devices are introduced to satisfy the user’s mobile computing needs, they are still unable to provide for the full mobile computing functionality as they confine the user mobility to be within certain regions in order to benefit from services provided by fixed network access points. Mobile ad hoc networks (MANETs) are introduced as the technology that potentially will make the nowadays illusion of mobile computing a tangible reality. MANETs are created by the mobile computing devices on an ad hoc basis, without any support or administration provided by a fixed or pre-installed communications infrastructure. Along with their appealing autonomy and fast deployment properties, MANETs exhibit some other properties that make their realization a very challenging task. Topology dynamism and bandwidth limitations of the communication channel adversely affect the performance of routing protocols designed for MANETs, especially with the increase in the number of mobile hosts and/or mobility rates. The Connected Dominating Set (CDS), a.k.a. virtual backbone or Spine, is proposed to facilitate routing, broadcasting, and establishing a dynamic infrastructure for distributed location databases. Minimizing the CDS produces a simpler abstracted topology of the MANET and allows for using shorter routes between any pair of hosts. Since it is NP-complete to find the minimum connected dominating set, MCDS, researchers resorted to approximation algorithms and heuristics to tackle this problem. The literature is rich of many CDS approximation algorithms that compete in terms of CDS size, running time, and signaling overhead. It has been reported that localized CDS creation algorithms are the fastest and the lightest in terms of signaling overhead among all other techniques. Examples of these localized CDS algorithms are Wu and Li algorithm and its Stojmonevic variant, the MPR algorithm, and Alzoubi algorithm. The designers of each of these algorithms claim that their algorithm exhibits the highest degree of localization and hence incurs the lowest cost in the CDS creation phase. However, these claims are not supported by any physical or at least simulation-based evidence. Moreover, the cost of maintaining the CDS (in terms of the change in CDS size, running time, and signaling overhead), in the presence of unpredictable and frequent topology changes, is an important factor that has to be taken into account — a cost that is overlooked most of the time. A simulation-based comparative study between the performance of these algorithms will be conducted using the ns2 network simulator. This study will focus on the total costs incurred by these algorithms in terms of CDS size, running time, and signaling overhead generated during the CDS creation and maintenance phases. Moreover, the effects of mobility rates, network size, and mobility models on the performance of each algorithm will be investigated. Conclusions regarding the pros and cons of each algorithm will be drawn, and directions for future research work will be recommended.

Quality control is changing along with the manufacturing environment. A series of revolutionary changes will occur in management contents, methods, capabilities, and real-time effectiveness and efficiency of management. As an essential factor in intelligent manufacturing, quality control systems require real and comprehensive innovation. Focused on new trends and developments in quality control from a worldwide perspective, this book presents the latest information on novel approaches in quality control. Its thirteen chapters cover three topics: intelligent manufacturing, robust design, and control charts.
The book includes the latest research advances and cutting-edge analyses of real case studies in the disciplines of Industrial Engineering and Operations Management from diverse international contexts. This work presents a revised version of the best papers presented at the XXIII International Conference on Industrial Engineering and Industrial Management promoted by ADINGOR (Asociación para el Desarrollo de la Ingeniería de Organización), which took place at the Polytechnic School of Engineering of Gijón (University of Oviedo), Asturias, Spain, from July 11th to 12th, 2019.

This contributed book focuses on major aspects of statistical quality control, shares insights into important new developments in the field, and adapts established statistical quality control methods for use in e.g. big data, network analysis and medical applications. The content is divided into two parts, the first of which mainly addresses statistical process control, also known as statistical process monitoring. In turn, the second part explores selected topics in statistical quality control, including measurement uncertainty analysis and data quality. The peer-reviewed contributions gathered here were originally presented at the 13th International Workshop on Intelligent Statistical Quality Control, ISQC 2019, held in Hong Kong on August 12-14, 2019. Taken together, they bridge the gap between theory and practice, making the book of interest to both practitioners and researchers in the field of statistical quality control.


This master thesis addresses the effect of materials and security systems used in high-rise office buildings on the evolution and spreading of fire. The first part of the thesis is a brief introduction to the nature of fire, how and why fire can develop. Also are described the three elements of triangle of fire (hazards of materials, sources of oxidants and sources of heat energy) as well as the effects of fire on people and the evolution of construction of high-rise buildings. In the second part of the thesis, are performed the simulations with different configurations and situations using the simulation tool FDS 5.2.0. Each simulation has a simulation report which explains what, how and why is happening in the simulation. The third and last part of the thesis is performed the analysis and comparisons between some cases with the aim of draw conclusions about the influence of materials and security systems in the evolution and spreading of fire.

Human Factors in the Nuclear Industry: A Systemic Approach to Safety presents the latest research and studies of human factors in the nuclear industry. It models and highlights scientific and technological foundations before providing practical examples of applications within the nuclear facility of human performance at an individual, group, organization, and system level. Editors Dr. Teperi and Dr. Gotcheva supply concrete models, tools and techniques based on research to provide the reader with knowledge of how to facilitate and support human performance in this dynamic and fast moving safety critical field. Models and case studies are provided to add practical benefits for the reader to apply to their own projects, including user friendly state-of-the-art equipment, fluent work processes for information flow, functional control room resource management, and scope for competence and learning in the work place. This book will benefit nuclear researchers, safety experts, human factors professionals and power plant operators, as well as those with an interest in human factors outside of the nuclear field. Provides a comprehensive framework for human factors, considering not only the individual, but also the team, organizational and industrial levels Presents tried and tested tools and techniques based on research from the nuclear industry Includes models, examples and case studies of user-friendly equipment, fluent work processes and functional control room resource management.

This book constitutes the refereed proceedings of the 15th European Conference on Ambient Intelligence, AmI 2019, held in Rome, Italy, in November 2019. The 20 full papers presented together with 10 short papers were carefully reviewed and selected from 50 submissions. The papers cover topics such as embedded devices that can merge inobtrusively and in natural ways using information and intelligence hidden in the network connecting these devices (e.g., the Internet of Things). The main topic of AmI 2019 was “Data-driven Ambient Intelligence,” which follows the vision of Calm Technology, where technology is useful but does not demand our full attention or interfere with our usual behavior and activities.

The Department of Statistical Sciences of the University of Bologna in collaboration with the Department of Management and Engineering of the University of Padova, the Department of Statistical Modelling of Saint Petersburg State University, and INFORMS Simulation Society sponsored the Seventh Workshop on Simulation. This international conference was devoted to statistical techniques in stochastic simulation, data collection, analysis of scientific experiments, and studies representing broad areas of interest. The previous workshops took place in St. Petersburg, Russia in 1994, 1996, 1998, 2001, 2005, and 2009. The Seventh Workshop took place in the Rimini Campus of the University of Bologna, which is in Rimini’s historical center.

This volume contains 59 papers presented at ICTIS 2015: International Conference on Information and Communication Technology for Intelligent Systems. The conference was held during 28th and 29th November,
The military services have experienced enormous downsizing efforts in the last decade. With these initiatives, organizations have had to derive innovative ways to meet their objectives with fewer resources. An organization’s structure is an avenue to address these challenges within the atmosphere of a shrinking capital budget. Organizational structure changes can affect every aspect of the organization. Such an impact suggests proposals for drastic organizational changes must meet the rigors of a full analysis. The intent of this research is to provide a comprehensive analysis of centralization options for Air Force Tuition Assistance efforts. This thesis effort involves the development and subsequent analysis of multiple simulation models. The models provide insight into whether or not centralization will produce savings in processing times, manpower, and cost. Results show that centralization will positively impact the Tuition Assistance organization in meeting their objectives while allowing the Air Force to take advantage of efficiencies through technological advancements.