Soft Computing In Textile Engineering Woodhead Publishing Series In Textiles

Proceedings of the International Conference on Soft Computing for Problem Solving (SocProS 2011) December 20-22, 2011Artificial Intelligence and Evolutionary Computations in Engineering SystemsSoft Computing Approaches in ChemistrySoft Computing ApplicationsSoft Computing ApplicationsArtificial Intelligence on Fashion and TextilesSoft Computing in Textile SciencesHandbook of Smart TextilesDigital Transformation of Enterprise ArchitectureWoven TextilesFrontiers of Textile MaterialsFunctional Textiles and ClothingSoft Computing ApplicationsCognitive Informatics and Soft ComputingSoft Computing ApplicationsProceedings of Fourth International Conference on Soft Computing for Problem SolvingFuzzy Filters for Image ProcessingProtective Armor Engineering DesignAdvanced Optimization and Decision-Making Techniques in Textile ManufacturingTextile Logic for a Soft SpaceSoft Computing in Textile EngineeringArtificial Neural NetworksProcess Control in Textile ManufacturingHandbook of Fibrous Materials, 2 VolumesFuzzy Sets and Fuzzy Decision-MakingColour DesignA First Course in Fuzzy and Neural ControlDecision Making and Soft ComputingPrinciples of Woven Fabric ManufacturingArtificial Intelligence for Fashion Industry in the Big Data EraEmerging Trends in Intelligent Computing and InformaticsAdvanced

Textile Engineering MaterialsHandbook of Environmental Materials ManagementAdvances in Modeling and Simulation in Textile EngineeringSimulation in Textile TechnologyComputational TextileDistributed Computing and Artificial Intelligence, 13th International ConferenceSoft Computing in Information Communication TechnologyAnalysis and Design of Intelligent Systems Using Soft Computing TechniquesElectrospinning of Nanofibers in Textiles

Proceedings of the International Conference on Soft Computing for Problem Solving (SocProS 2011) December 20-22, 2011

This book comprises a selection of papers on new methods for analysis and design of hybrid intelligent systems using soft computing techniques from the IFSA 2007 World Congress, held in Cancun, Mexico, June 2007.

Artificial Intelligence and Evolutionary Computations in Engineering Systems

There is increasing interest in the area of protective vests, either for protection against bullets or protection from the most realistic threats within domestic frontline operations: edged weapon, knives, and medical needles. This volume addresses that need. This new book provides an in-depth survey of the state-of-the-art research and practical techniques

in the area of protected fabrics, especially stab-resistant and bulletproof fabrics. The book covers: • The history of protective armor: the long history of the art of protective armor manufacturing. • Materials used for body armor: the design and materials used for soft armor to increase its perforation-resistance utilizing high-performance fibers. • Anti-stab and anti-bullet armor design: the different design parameters required for the design of flexible armor in order to stop high-velocity projectiles. • The comfort of the body armor design: the flexibility, thermal resistivity, and evaporative moisture resistivity through the fabric. • Methods of testing the flexible body armors: testing the components of flexible body armor, according to the level of the protection required, such as NIJ Standards, HOSDB Body Armour Standards for UK Police, and the German SK1 Standard, among others. Written by an expert in textile composite material engineering, this volume fills an important gap in the area of protective fabric against stabbing or bullets and provides invaluable practical knowledge for body armor design.

Soft Computing Approaches in Chemistry

Computational techniques have been widely applied in the textile industry and garment industry since the 1950's. This book surveys representative applications of computational techniques, including Textile quality assessment by image analysis; Modeling and simulation of textile structures, Computer aided garment design, Computerized textile management and textile Supply Chain, Textile quality subjective

and objective evaluation; Computational thermal bioengineering of textiles and clothing; Computational biomechanical engineering of textiles and clothing.

Soft Computing Applications

This book presents the proceedings of the 8th International Workshop on Soft Computing Applications, SOFA 2018, held on 13–15 September 2018 in Arad, Romania. The workshop was organized by Aurel Vlaicu University of Arad, in conjunction with the Institute of Computer Science, Iasi Branch of the Romanian Academy, IEEE Romanian Section, Romanian Society of Control Engineering and Technical Informatics – Arad Section, General Association of Engineers in Romania – Arad Section and BTM Resources Arad. The papers included in these proceedings, published post-conference, cover the research including Knowledge-Based Technologies for Web Applications, Cloud Computing, Security Algorithms and Computer Networks, Business Process Management, Computational Intelligence in Education and Modelling and Applications in Textiles and many other areas related to the Soft Computing. The book is directed to professors, researchers, and graduate students in area of soft computing techniques and applications.

Soft Computing Applications

This is a collection of the accepted papers concerning soft computing in information communication technology. All accepted papers are subjected to

strict peer-reviewing by 2 expert referees. The resultant dissemination of the latest research results, and the exchanges of views concerning the future research directions to be taken in this field makes the work of immense value to all those having an interest in the topics covered. The present book represents a cooperative effort to seek out the best strategies for effecting improvements in the quality and the reliability of Neural Networks, Swarm Intelligence, Evolutionary Computing, Image Processing Internet Security, Data Security, Data Mining, Network Security and Protection of data and Cyber laws. Our sincere appreciation and thanks go to these authors for their contributions to this conference. I hope you can gain lots of useful information from the book.

Artificial Intelligence on Fashion and Textiles

Advanced Textile Engineering Materials is written to educate readers about the use of advanced materials in various textile applications. In the first part, the book addresses recent advances in chemical finishing, and also highlights environmental issues in textile sectors. In the second part, the book provides a compilation of innovative fabrication strategies frequently adopted for the mechanical finishing of textiles. The key topics are • Smart textiles • Functional modifications • Protective textiles • Conductive textiles • Coated/laminated textiles • Antimicrobial textiles • Environmental aspects in textiles • Textile materials in composites • 3-D woven preforms for composite reinforcement • Evolution of

soft body armor

Soft Computing in Textile Sciences

FLINS, originally an acronym for Fuzzy Logic and Intelligent Technologies in Nuclear Science, is now extended to Computational Intelligence for applied research. The contributions to the 11th of FLINS conference cover state-of-the-art research, development, and technology for computational intelligence systems, both from the foundations and the applications points-of-view. Contents:Invited Lectures:The Contribution of Fuzzy Sets to Decision Sciences (D Dubois)Granular Fuzzy Systems: A New Direction in Soft Computing and Human Centric Decision-Making (Witold Pedrycz)Some Approaches Towards Lattice Computing in Mathematical Morphology and Computational Intelligence (Peter Sussner)Decision Making and Decision Support SystemsStatistics, Data Analysis and Data MiningFoundations of Computational IntelligenceSoft Computing and Applied ResearchIntelligent Systems and Knowledge EngineeringUncertainty ModelingIntelligent Information Processing Readership: Graduate students, researchers, and academics in artificial intelligence/machine learning, information management, decision sciences, databases/information sciences and fuzzy logic. Keywords:FLINS 2014;Soft Computing;Knowledge Engineering;Decision Making

Handbook of Smart Textiles

Although the use of fuzzy control methods has grown nearly to the level of classical control, the true understanding of fuzzy control lags seriously behind. Moreover, most engineers are well versed in either traditional control or in fuzzy control-rarely both. Each has applications for which it is better suited, but without a good understanding of both, engineers cannot make a sound determination of which technique to use for a given situation. A First Course in Fuzzy and Neural Control is designed to build the foundation needed to make those decisions. It begins with an introduction to standard control theory, then makes a smooth transition to complex problems that require innovative fuzzy, neural, and fuzzy-neural techniques. For each method, the authors clearly answer the questions: What is this new control method? Why is it needed? How is it implemented? Real-world examples, exercises, and ideas for student projects reinforce the concepts presented. Developed from lecture notes for a highly successful course titled The Fundamentals of Soft Computing, the text is written in the same reader-friendly style as the authors' popular A First Course in Fuzzy Logic text. A First Course in Fuzzy and Neural Control requires only a basic background in mathematics and engineering and does not overwhelm students with unnecessary material but serves to motivate them toward more advanced studies.

Digital Transformation of Enterprise Architecture

These two volumes constitute the Proceedings of the

7th International Workshop on Soft Computing Applications (SOFA 2016), held on 24–26 August 2016 in Arad, Romania. This edition was organized by Aurel Vlaicu University of Arad, Romania, University of Belgrade, Serbia, in conjunction with the Institute of Computer Science, Iasi Branch of the Romanian Academy, IEEE Romanian Section, Romanian Society of Control Engineering and Technical Informatics (SRAIT) - Arad Section, General Association of Engineers in Romania - Arad Section, and BTM Resources Arad. The soft computing concept was introduced by Lotfi Zadeh in 1991 and serves to highli ght the emergence of computing methodologies in which the accent is on exploiting the tolerance for imprecision and uncertainty to achieve tractability, robustness and lower costs. Soft computing facilitates the combined use of fuzzy logic, neurocomputing, evolutionary computing and probabilistic computing, leading to the concept of hybrid intelligent systems. The rapid emergence of new tools and applications calls for a synergy of scientific and technological disciplines in order to reveal the great potential of soft computing in all domains. The conference papers included in these proceedings, published post-conference, were grouped into the following areas of research: • Methods and Applications in Electrical Engineering • Knowledge-Based Technologies for Web Applications, Cloud Computing, Security Algorithms and Computer Networks • Biomedical Applications • Image, Text and Signal Processing • Machine Learning and Applications • Business Process Management • Fuzzy Applications, Theory and Fuzzy Control • Computational Intelligence in Education • Soft Computing & Fuzzy Logic in Biometrics (SCFLB) • Soft

Computing Algorithms Applied in Economy, Industry and Communication Technology • Modelling and Applications in Textiles The book helps to disseminate advances in selected active research directions in the field of soft computing, along with current issues and applications of related topics. As such, it provides valuable information for professors, researchers and graduate students in the area of soft computing techniques and applications.

Woven Textiles

Traditionally used in apparel and interior fabrics, woven textiles are increasingly being employed in a variety of technical applications. Woven textiles: Principles, developments and applications provides an essential overview of the manufacture, structure and application of these important textiles. Beginning with an introduction to the fibres and yarns used in weaving, part one goes on to explore key preparatory techniques and the fundamentals of weaving technology. The characteristics of woven structures are then discussed in greater depth in part two, alongside investigation into the use of computer assisted design (CAD) systems, techniques for modelling the structure of woven fabrics, and methods for the manufacture of 3D woven structures. Part three focuses of the application of woven textiles to a wide range of technologies. The use of woven textiles in automotive interiors and other transport applications is discussed, along with woven apparel fabrics, geotextiles, hollow woven fabrics and woven textiles for medical applications. With its

distinguished editor and international team of expert contributors, Woven textiles: Principles, developments and applications is an indispensable guide for all designers, engineers and technicians involved in the design, manufacture and use of woven textiles. It also provides a useful overview of woven textile processing and applications for academics and students. Provides an essential overview of the manufacture, structure and application of woven textiles Explores key preparatory techniques and the fundamentals of weaving technology and discusses the characteristics of woven structures Covers the use of computer-assisted design (CAD) systems and methods for the manufacture of 3D woven structures, among other topics

Frontiers of Textile Materials

"In this book, Vivek Kale makes an important contribution to the theory and practice of enterprise architecture this book captures the breadth and depth of information that a modern enterprise architecture must address to effectively support an agile enterprise. This book should have a place in every practicing architect's library." —John D. McDowall, Author of Complex Enterprise Architecture Digital Transformation of Enterprise Architecture is the first book to propose Enterprise Architecture (EA) as the most important element (after Business Models) for digital transformation of enterprises. This book makes digital transformation more tangible by showing the rationale and typical technologies associated with it, and these technologies in turn reveal the essence of

digital transformation. This book would be useful for analysts, designers and developers of future-ready agile application systems. This book proposes that it is the perennial quest for interoperability & portability, scalability, availability, etc., that has directed and driven the evolution of the IT/IS industry in the past 50 years. It is this very quest that has led to the emergence of technologies like service-oriented, cloud, and big data computing. In addition to the conventional attributes of EA like interoperability, scalability and availability, this book identifies additional attributes of mobility, ubiquity, security, analyticity, and usability. This pragmatic book: Identifies three parts effort for any digital transformation: Business Models, Enterprise Architectures and Enterprise Processes. Describes eight attributes of EA: interoperability, scalability, availability, mobility, ubiquity, security, analyticity, and usability. Explains the corresponding technologies of service-oriented, cloud, big data, context-aware, Internet of Things (IoT), blockchain, soft, and interactive computing. Briefs on auxiliary technologies like integration, virtualization, replication, spatio-temporal databases, embedded systems, cryptography, data mining, and interactive interfaces that are essential for digital transformation of enterprise architecture. Introduces interactive interfaces like voice, gaze, gesture and 3D interfaces. Provides an overview of blockchain computing, soft computing, and customer interaction systems. Digital Transformation of Enterprise Architecture proposes that to withstand the disruptive digital storms of the future, enterprises must bring about digital transformation, i.e. a transformation that affects an

exponential change (amplification or attenuation) in any aspect of the constituent attributes of EA. It proposes that each of these technologies (service-oriented, cloud, big data, context-aware, IoT, blockchain, soft, and interactive computing) bring about digital transformation of the corresponding EA attribute viz. interoperability, scalability, availability, mobility, ubiquity, security, analyticity, and usability.

Functional Textiles and Clothing

The 13th International Symposium on Distributed Computing and Artificial Intelligence 2016 (DCAI 2016) is a forum to present applications of innovative techniques for studying and solving complex problems. The exchange of ideas between scientists and technicians from both the academic and industrial sector is essential to facilitate the development of systems that can meet the ever-increasing demands of today's society. The present edition brings together past experience, current work and promising future trends associated with distributed computing, artificial intelligence and their application in order to provide efficient solutions to real problems. This symposium is organized by the University of Sevilla (Spain), Osaka Institute of Technology (Japan), and the Universiti Teknologi Malaysia (Malaysia)

Soft Computing Applications

The idea of simulating the brain was the goal of many pioneering works in Artificial Intelligence. The brain

has been seen as a neural network, or a set of nodes, or neurons, connected by communication lines. Currently, there has been increasing interest in the use of neural network models. This book contains chapters on basic concepts of artificial neural networks, recent connectionist architectures and several successful applications in various fields of knowledge, from assisted speech therapy to remote sensing of hydrological parameters, from fabric defect classification to application in civil engineering. This is a current book on Artificial Neural Networks and Applications, bringing recent advances in the area to the reader interested in this always-evolving machine learning technique.

Cognitive Informatics and Soft Computing

The Proceedings of SocProS 2014 serves as an academic bonanza for scientists and researchers working in the field of Soft Computing. This book contains theoretical as well as practical aspects using fuzzy logic, neural networks, evolutionary algorithms, swarm intelligence algorithms, etc., with many applications under the umbrella of 'Soft Computing'. The book is beneficial for young as well as experienced researchers dealing across complex and intricate real world problems for which finding a solution by traditional methods is a difficult task. The different application areas covered in the Proceedings are: Image Processing, Cryptanalysis, Industrial Optimization, Supply Chain Management, Newly Proposed Nature Inspired Algorithms, Signal

Processing, Problems related to Medical and Healthcare, Networking Optimization Problems, etc.

Soft Computing Applications

This book brings together original work from a number of authors who have made significant contributions to the evolution and use of nonstandard computing methods in chemistry and pharmaceutical industry. The contributions to this book cover a wide range of applications of Soft Computing to the chemical domain. Soft Computing applications are able to approximate many different kinds of real-world systems; to tolerate imprecision, partial truth, and uncertainty; and to learn from their environment and generate solutions of low cost, high robustness, and tractability. Presented applications are the optimization of the structure of atom clusters, the design of safe textile materials, real-time monitoring of pollutants in the workplace, quantitative structure-activity relationships, the analysis of Mössbauer spectra, the synthesis of methanol or the use of bioinformatics in the clustering of data within large biochemical databases. With this diverse range of applications, the book appeals to professionals, researchers and developers of software tools for the design of Soft Computing-based systems in chemistry and pharmaceutical industry, and to many others within the computational intelligence community.

Proceedings of Fourth International Conference on Soft Computing for Problem Solving

The increasing number of applications of fuzzy mathematics has generated interest in widely ranging fields, from engineering and medicine to the humanities and management sciences. Fuzzy Sets and Fuzzy Decision-Making provides an introduction to fuzzy set theory and lays the foundation of fuzzy mathematics and its applications to decision-making. New concepts are simplified with the use of figures and diagrams, and methods are discussed in terms of their direct applications in obtaining solutions to real problems, particularly to decision-related problems. The first chapter presents the current state of knowledge of fuzzy set theory, using pan-Venn-diagrams to illustrate mathematical concepts. The second chapter clearly describes the theory of factor spaces, on which fuzzy decision-making is based. The remainder of the book is devoted to the methods, applications, techniques, and examples of this fuzzy decision-making, and includes methods for determining membership functions and for treating multifactorial and variable weights analyses.

Fuzzy Filters for Image Processing

This book provides an overview of current issues and challenges in the fashion industry and an update on data-driven artificial intelligence (AI) techniques and their potential implementation in response to those challenges. Each chapter starts off with an example of a data-driven AI technique on a particular sector of the fashion industry (design, manufacturing, supply or retailing), before moving on to illustrate its implementation in a real-world application

Protective Armor Engineering Design

The book presents new approaches and methods for solving real-world problems. It highlights, in particular, innovative research in the fields of Cognitive Informatics, Cognitive Computing, Computational Intelligence, Advanced Computing, and Hybrid Intelligent Models and Applications. New algorithms and methods in a variety of fields are presented, together with solution-based approaches. The topics addressed include various theoretical aspects and applications of Computer Science, Artificial Intelligence, Cybernetics, Automation Control Theory, and Software Engineering.

Advanced Optimization and Decision-Making Techniques in Textile Manufacturing

This book presents the proceedings of the 4th International Conference of Reliable Information and Communication Technology 2019 (IRICT 2019), which was held in Pulai Springs Resort, Johor, Malaysia, on September 22–23, 2019. Featuring 109 papers, the book covers hot topics such as artificial intelligence and soft computing, data science and big data analytics, internet of things (IoT), intelligent communication systems, advances in information security, advances in information systems and software engineering.

Textile Logic for a Soft Space

Edited by a leading expert in the field with contributions from experienced researchers in fibers and textiles, this handbook reviews the current state of fibrous materials and provides a broad overview of their use in research and development. Volume One focuses on the classes of fibers, their production and characterization, while the second volume concentrates on their applications, including emerging ones in the areas of energy, environmental science and healthcare. Unparalleled knowledge of high relevance to academia and industry.

Soft Computing in Textile Engineering

Complex raw materials and manufacturing processes mean the textile industry is particularly dependent on good process control to produce high and consistent product quality. Monitoring and controlling process variables during the textile manufacturing process also minimises waste, costs and environmental impact. Process control in textile manufacturing provides an important overview of the fundamentals and applications of process control methods. Part one introduces key issues associated with process control and principles of control systems in textile manufacturing. Testing and statistical quality control are also discussed before part two goes on to consider control in fibre production and yarn manufacture. Chapters review process and quality control in natural and synthetic textile fibre cultivation, blowroom, carding, drawing and combing. Process control in ring and rotor spinning and maintenance of yarn spinning machines are also

discussed. Finally part three explores process control in the manufacture of knitted, woven, nonwoven textiles and colouration and finishing, with a final discussion of process control in apparel manufacturing. With its distinguished editors and international team of expert contributors, Process control in textile manufacturing is an essential guide for textile engineers and manufacturers involved in the processing of textiles, as well as academic researchers in this field. Provides an important overview of the fundamentals and applications of process control methods Discusses key issues associated with process control and principles of control systems in textile manufacturing, before addressing testing and statistical quality control Explores process control in the manufacture of knitted, woven, nonwoven textiles and colouration and finishing, with a discussion on process control in apparel manufacturing

Artificial Neural Networks

These two volumes constitute the Proceedings of the 7th International Workshop on Soft Computing Applications (SOFA 2016), held on 24–26 August 2016 in Arad, Romania. This edition was organized by Aurel Vlaicu University of Arad, Romania, University of Belgrade, Serbia, in conjunction with the Institute of Computer Science, Iasi Branch of the Romanian Academy, IEEE Romanian Section, Romanian Society of Control Engineering and Technical Informatics (SRAIT) - Arad Section, General Association of Engineers in Romania - Arad Section, and BTM

Resources Arad. The soft computing concept was introduced by Lotfi Zadeh in 1991 and serves to highli ght the emergence of computing methodologies in which the accent is on exploiting the tolerance for imprecision and uncertainty to achieve tractability, robustness and lower costs. Soft computing facilitates the combined use of fuzzy logic, neurocomputing, evolutionary computing and probabilistic computing, leading to the concept of hybrid intelligent systems. The rapid emergence of new tools and applications calls for a synergy of scientific and technological disciplines in order to reveal the great potential of soft computing in all domains. The conference papers included in these proceedings, published post-conference, were grouped into the following areas of research: • Methods and Applications in Electrical Engineering • Knowledge-Based Technologies for Web Applications, Cloud Computing, Security Algorithms and Computer Networks • Biomedical Applications • Image, Text and Signal Processing • Machine Learning and Applications • &nb sp; Business Process Management • Fuzzy Applications, Theory and Fuzzy Control • Computational Intelligence in Education • Soft Computing & Fuzzy Logic i n Biometrics (SCFLB) • Soft Computing Algorithms Applied in Economy, Industry and Communication Technology • Modelling and Applications in Textiles The book helps to disseminate advances in selected active research directions in the field of soft computing, along with current issues and applications of related topics. As such, it provides valuable information for professors, researchers and graduate students in the area of soft computing techniques and applications.

Process Control in Textile Manufacturing

Weaving as a subject is an integral part of any textile engineering/technology program, the others being fibre manufacturing, yarn manufacturing and textile chemical processing. This book amalgamates both the compartments (preparatory processes and the loom mechanism) of weaving technology and presents a holistic picture. The machine descriptions are presented from the viewpoint of principles and no attempt has been made to make them exhaustive by incorporating various models or variants. The mathematical relations among various parameters have been derived starting from the first principles and each chapter concludes with solved numerical examples.

Handbook of Fibrous Materials, 2 Volumes

The “Handbook of Smart Textiles” aims to provide a comprehensive overview in the field of smart textile describing the state of the art in the research sector as well as the well-established techniques applied in industries. The handbook is planned to cover from fundamental theories, experimental techniques, characterization methods, as well as real applications with successful commercialized examples. The book is structured in a way in which it is appropriate for graduate students, PhD candidates, and professionals in diverse scientific and engineering communities devoted to relevant fields, including textile engineering, chemistry, bioengineering, material

engineering, mechanical engineering, electrical engineering. The book will also provide a solid reference for industrial players who look for innovative technologies as well as environmental, safety concerns for the development of smart textile related products.

Fuzzy Sets and Fuzzy Decision-Making

The book “Frontiers and Textile Materials will deal with the important materials that can be utilized for value-addition and functionalization of textile materials. The topics covered in this book includes the materials like enzymes, polymers, etc. that are utilized for conventional textile processing and the advanced materials like nanoparticles which are expected to change the horizons of textiles. The futuristic techniques for textile processing like plasma are also discussed.

Colour Design

The objective is to provide the latest developments in the area of soft computing. These are the cutting edge technologies that have immense application in various fields. All the papers will undergo the peer review process to maintain the quality of work.

A First Course in Fuzzy and Neural Control

Given its importance in analysing and influencing the world around us, an understanding of colour is a vital

tool in any design process. Colour design provides a comprehensive review of the issues surrounding the use of colour, from the fundamental principles of what colour is to its important applications across a vast range of industries. Part one covers the main principles and theories of colour, focusing on the human visual system and the psychology of colour perception. Part two goes on to review colour measurement and description, including consideration of international standards, approval methods for textiles and lithographic printing, and colour communication issues. Forecasting colour trends and methods for design enhancement are then discussed in part three along with the history of colour theory, dyes and pigments, and an overview of dye and print techniques. Finally, part four considers the use of colour across a range of specific applications, from fashion, art and interiors, to food and website design. With its distinguished editor and international team of contributors, Colour design is an invaluable reference tool for all those researching or working with colour and design in any capacity. Provides a comprehensive review of the issues surrounding the use of colour in textiles Discusses the application of colour across a vast range of industries Chapters cover the theories, measurement and description of colour, forecasting colour trends and methods for design enhancement

Decision Making and Soft Computing

Advances in Modeling and Simulation in Textile Engineering: New Concepts, Methods, and Applications explains the advanced principles and

techniques that can be used to solve textile engineering problems using numerical modeling and simulation. Textile engineering involves complex processes which are not easily expressed numerically or simulated, such as fiber motion simulation, yarn to fiber formation, melt spinning technology, optimization of yarn production, textile machinery design and optimization, and modeling of textile/fabric reinforcements. This book draws on innovative research and industry practice to explain methods for the modeling of all of these processes, helping readers to apply computational power to more areas of textile engineering than ever before. Experimental results are presented and linked closely to the processes, and to the methods of implementation. Diverse concepts such as heat transfer, fluid dynamics, three-dimensional motion, and multi-phase flow are addressed as part of this. Covering all sides of this topic, tools, theoretical principles, and numerical models are extensively presented. Provides new approaches and techniques to simulate a wide range of textile processes from geometry to manufacturing Includes coverage of detailed mathematical methods for textiles, including neural networks and genetic algorithms as well as the finite element method Addresses modeling techniques for many different phenomena, including heat transfer, fluid dynamics, and multi-phase flow

Principles of Woven Fabric Manufacturing

This volume contains select papers presented during

the Functional Textiles and Clothing Conference 2018. The book covers the recent scientific developments, cutting edge technologies, innovations, trends, challenges and opportunities in the field of functional and smart textiles and clothing. The contents of this volume will be of interest to researchers, professional engineers, entrepreneurs, and market stakeholders interested in functional textiles and clothing.

Artificial Intelligence for Fashion Industry in the Big Data Era

This book gathers selected papers presented at the 4th International Conference on Artificial Intelligence and Evolutionary Computations in Engineering Systems, held at the SRM Institute of Science and Technology, Kattankulathur, Chennai, India, from 11 to 13 April 2019. It covers advances and recent developments in various computational intelligence techniques, with an emphasis on the design of communication systems. In addition, it shares valuable insights into advanced computational methodologies such as neural networks, fuzzy systems, evolutionary algorithms, hybrid intelligent systems, uncertain reasoning techniques, and other machine learning methods and their application to decision-making and problem-solving in mobile and wireless communication networks.

Emerging Trends in Intelligent Computing and Informatics

Optimization and decision making are integral parts of

any manufacturing process and management system. The objective of this book is to demonstrate the confluence of theory and applications of various types of multi-criteria decision making and optimization techniques with reference to textile manufacturing and management. Divided into twelve chapters, it discusses various multi-criteria decision-making methods such as AHP, TOPSIS, ELECTRE, and optimization techniques like linear programming, fuzzy linear programming, quadratic programming, in textile domain. Multi-objective optimization problems have been dealt with two approaches, namely desirability function and evolutionary algorithm. Key Features Exclusive title covering textiles and soft computing fields including optimization and decision making Discusses concepts of traditional and non-traditional optimization methods with textile examples Explores pertinent single-objective and multi-objective optimizations Provides MATLAB coding in the Appendix to solve various types of multi-criteria decision making and optimization problems Includes examples and case studies related to textile engineering and management

Advanced Textile Engineering Materials

The ongoing increase in scale of integration of electronics makes storage and computational power affordable to many applications. Also image process ing systems can benefit from this trend. A variety of algorithms for image processing tasks becomes close at hand. From the whole range of possible approaches, those based on fuzzy logic are the ones

this book focusses on. A particular useful property of fuzzy logic techniques is their ability to represent knowledge in a way which is comprehensible to human interpretation. The theory of fuzzy sets and fuzzy logic was initiated in 1965 by Zadeh, and is one of the most developed models to treat imprecision and uncertainty. Instead of the classical approach that an object belongs or does not belong to a set, the concept of a fuzzy set allows a gradual transition from mem bership to nonmembership, providing partial degrees of membership. Fuzzy techniques are often complementary to existing techniques and can contribute to the development of better and more robust methods, as has already been illustrated in numerous scientific branches. The present book resulted from the workshop "Fuzzy Filters for Image Processing" which was organized at the 10th FUZZ-IEEE Conference in Mel bourne, Australia. At this event several speakers have given an overview of the current state-of-the-art of fuzzy filters for image processing. Afterwards, the book has been completed with contributions of other international re searchers.

Handbook of Environmental Materials Management

The book includes the Proceedings of the Artificial Intelligence on Fashion and Textiles conference 2018 which provides state-of-the-art techniques and applications of AI in the fashion and textile industries. It is essential reading for scientists, researchers and R&D professionals working in the field of AI with applications in the fashion and textile industry;

managers in the fashion and textile enterprises; and anyone with an interest in the applications of AI. Over the last two decades, with the great advancement of computer technology, academic research in artificial intelligence (AI) and its applications in fashion and textile supply chain has been becoming a very hot topic and has received greater attention from both academics and industrialists. A number of AI-related techniques has been successfully employed and proven to handle the problems including fashion sales forecasting, supply chain optimization, planning and scheduling, textile material defect detection, fashion and textile image recognition, fashion image and style retrieval, human body modeling and fitting, etc.

Advances in Modeling and Simulation in Textile Engineering

Simulation in Textile Technology

This reference work analyzes and assesses global environmental management techniques for environmental materials with a focus on their performance and economic benefits, proposing eco-friendly solutions and designating policies that will sustain the environment for future generations. It addresses management of environmental materials as not only a complex anthropogenic problem, but also as an expensive problem that needs to be managed sustainably. Simultaneously, it considers the environmental and economic benefits involved in the high levels of investment and operation costs

required to develop effective materials collection and management systems in modern society.

Computational Textile

Electrospinning of nanofibers has emerged as a specialized processing technique for the formation of sub-micron fibers, with high specific surface areas. Electrospinning of Nanofibers in Textiles presents important new research in the dynamic and emerging field of electrospinning and covers all aspects of the technology as used to produce nanofibers.

Distributed Computing and Artificial Intelligence, 13th International Conference

The use of mathematical modelling and computer simulation can vastly improve the quality, efficiency and economic success of textile technology. Simulation in textile technology provides a comprehensive review of the key principles, applications and benefits of modelling for textile production. After an introduction to modelling and simulation, Simulation in textile technology goes on to review the principles and applications of the main types of model. The book first discusses neural networks and their applications before going on to explore evolutionary methods and fuzzy logic. It then considers computational fluid dynamics and finite element modelling. The modelling of fibrous structures and yarns are considered in the following chapters, along with wound packages, woven, braided

and knitted structures. The book concludes by reviewing the simulation of textile processes and machinery. With its distinguished editor and team of expert contributors, Simulation in textile technology is a valuable reference tool for all those involved in both developing models of textile processes and those applying them to improve process efficiency and product quality. Provides a comprehensive review of the key principles, applications and benefits of modelling for textile production Discusses neural networks and their applications before going on to explore evolutionary methods and fuzzy logic Considers the modelling of fibrous structures and yarns, along with wound packages, woven, braided and knitted structures

Soft Computing in Information Communication Technology

Soft computing refers to a collection of computational techniques which study, model and analyse complex phenomena. As many textile engineering problems are inherently complex in nature, soft computing techniques have often provided optimum solutions to these cases. Although soft computing has several facets, it mainly revolves around three techniques; artificial neural networks, fuzzy logic and genetic algorithms. The book is divided into five parts, covering the entire process of textile production, from fibre manufacture to garment engineering. These include soft computing techniques in yarn manufacture and modelling, fabric and garment manufacture, textile properties and applications and

textile quality evaluation. Covers the entire process of textile production, from fibre manufacture to garment engineering including artificial neural networks, fuzzy logic and genetic algorithms Examines soft computing techniques in yarn manufacture and modelling, fabric and garment manufacture Specifically reviews soft computing in relation to textile properties and applications featuring garment modelling and sewing machines

Analysis and Design of Intelligent Systems Using Soft Computing Techniques

Textiles and computing have long been associated. High volume and low profit margins of textile products have driven the industry to invest in high technology, particularly in the area of data interpretation and analysis. Thus, it is virtually inevitable that soft computing has found a home in the textile industry. Contained in this volume are six chapters discussing various aspects of soft computing in the field of textiles and apparel.

Electrospinning of Nanofibers in Textiles

This book presents the proceedings of the 8th International Workshop on Soft Computing Applications, SOFA 2018, held on 13–15 September 2018 in Arad, Romania. The workshop was organized by Aurel Vlaicu University of Arad, in conjunction with the Institute of Computer Science, Iasi Branch of the Romanian Academy, IEEE Romanian Section,

Romanian Society of Control Engineering and Technical Informatics – Arad Section, General Association of Engineers in Romania – Arad Section and BTM Resources Arad. The papers included in these proceedings, published post-conference, cover the research including Knowledge-Based Technologies for Web Applications, Cloud Computing, Security Algorithms and Computer Networks, Business Process Management, Computational Intelligence in Education and Modelling and Applications in Textiles and many other areas related to the Soft Computing. The book is directed to professors, researchers, and graduate students in area of soft computing techniques and applications.