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This book covers the issues related to optimization of engineering and management problems using soft computing techniques with an industrial outlook. It covers a broad area related to real life complex decision making problems using a heuristics approach. It also explores a wide perspective and future directions in industrial engineering research on a global platform/scenario. The book highlights the concept of optimization, presents various soft computing techniques, offers sample problems, and discusses related software programs complete with illustrations. Features Explains the

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concept of optimization and relevance to soft computing techniques towards optimal solution in engineering and management Presents various soft computing techniques Offers problems and their optimization using various soft computing techniques Discusses related software programs, with illustrations Provides a step-by-step tutorial on how to handle relevant software for obtaining the optimal solution to various engineering problems

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.

This book comprises a selection of papers on theoretical advances and applications of fuzzy logic and soft computing

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from the IFSA 2007 World Congress, held in Cancun, Mexico, June 2007. These papers constitute an important contribution to the theory and applications of fuzzy logic and soft computing methodologies.

Admittedly, the notion “intelligence or intelligent computing” has been around us for several decades, implicitly indicating any non-conventional methods of solving complex system problems such as expert systems and intelligent control techniques that mimic human skill and replace human operators for automation. Various kinds of intelligent methods have been suggested, phenomenological or ontological, and we have been witnessing quite successful applications. On the other hand, “Soft Computing Techniques” is the concept coined by Lot? Zadeh, referring to “a set of approaches of

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computing which parallels the remarkable ability of the human mind to reason and learn in an environment of uncertainty, imprecision and partial truth. ” Such a notion is well contrasted with the conventional binary logic based hard computing and has been effectively utilized with the guiding principle of “exploiting the tolerance for uncertainty, imprecision and partial truth to achieve tractability, - bustness and low solution cost. ” The soft computing techniques are often employed as the technical entities in a tool box with tools being FL, ANN, Rough Set, GA etc. Based on one’s intuition and experience, an engineer can build and realize hum- like systems by smartly mixing proper technical tools effectively and ef?ciently in a wide range of ?elds. For some time, the soft computing techniques are also referred to

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as intelligent computing tools.

Soft Computing Approaches in Chemistry

Soft Computing Approach for Mathematical Modeling of
Engineering Problems

Real Life Applications of Soft Computing

Prospects, Tools and Applications

SocProS 2017, Volume 1

Soft computing is a consortium of computing methodologies that provide a foundation for the conception, design, and deployment of intelligent systems and aims to formalize the human ability to make rational decisions in an environment of uncertainty and imprecision. This book is based on a NATO Advanced

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Study Institute held in 1996 on soft computing and its applications. The distinguished contributors consider the principal constituents of soft computing, namely fuzzy logic, neurocomputing, genetic computing, and probabilistic reasoning, the relations between them, and their fusion in industrial applications. Two areas emphasized in the book are how to achieve a synergistic combination of the main constituents of soft computing and how the combination can be used to achieve a high Machine Intelligence Quotient.

This two-volume book presents the outcomes of the 8th International Conference on Soft Computing for Problem

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Solving, SocProS 2018. This conference was a joint technical collaboration between the Soft Computing Research Society, Liverpool Hope University (UK), and Vellore Institute of Technology (India), and brought together researchers, engineers and practitioners to discuss thought-provoking developments and challenges in order to select potential future directions. The book highlights the latest advances and innovations in the interdisciplinary areas of soft computing, including original research papers on algorithms (artificial immune systems, artificial neural networks, genetic algorithms, genetic programming, and particle swarm optimization) and applications (control

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systems, data mining and clustering, finance, weather forecasting, game theory, business and forecasting applications). It offers a valuable resource for both young and experienced researchers dealing with complex and intricate real-world problems that are difficult to solve using traditional methods.

This book plays a significant role in improvising human life to a great extent. The new applications of soft computing can be regarded as an emerging field in computer science, automatic control engineering, medicine, biology application, natural environmental engineering, and pattern recognition. Now, the exemplar

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model for soft computing is human brain. The use of various techniques of soft computing is nowadays successfully implemented in many domestic, commercial, and industrial applications due to the low-cost and very high-performance digital processors and also the decline price of the memory chips. This is the main reason behind the wider expansion of soft computing techniques and its application areas. These computing methods also play a significant role in the design and optimization in diverse engineering disciplines. With the influence and the development of the Internet of things (IoT) concept, the need for using soft computing techniques has become

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more significant than ever. In general, soft computing methods are closely similar to biological processes than traditional techniques, which are mostly based on formal logical systems, such as sentential logic and predicate logic, or rely heavily on computer-aided numerical analysis. Soft computing techniques are anticipated to complement each other. The aim of these techniques is to accept imprecision, uncertainties, and approximations to get a rapid solution. However, recent advancements in representation soft computing algorithms (fuzzy logic, evolutionary computation, machine learning, and probabilistic reasoning) generate a more intelligent and

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robust system providing a human interpretable, low-cost, approximate solution. Soft computing-based algorithms have demonstrated great performance to a variety of areas including multimedia retrieval, fault tolerance, system modelling, network architecture, Web semantics, big data analytics, time series, biomedical and health informatics, etc. Soft computing approaches such as genetic programming (GP), support vector machine–firefly algorithm (SVM-FFA), artificial neural network (ANN), and support vector machine–wavelet (SVM–Wavelet) have emerged as powerful computational models. These have also shown significant success in dealing with massive

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data analysis for large number of applications. All the researchers and practitioners will be highly benefited those who are working in field of computer engineering, medicine, biology application, signal processing, and mechanical engineering. This book is a good collection of state-of-the-art approaches for soft computing-based applications to various engineering fields. It is very beneficial for the new researchers and practitioners working in the field to quickly know the best performing methods. They would be able to compare different approaches and can carry forward their research in the most important area of research which has direct impact

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on betterment of the human life and health. This book is very useful because there is no book in the market which provides a good collection of state-of-the-art methods of soft computing-based models for multimedia retrieval, fault tolerance, system modelling, network architecture, Web semantics, big data analytics, time series, and biomedical and health informatics.

This book explores the concept of artificial intelligence based on knowledge-based algorithms. Given the current hardware and software technologies and artificial intelligence theories, we can think of how efficient to provide a solution, how best to implement a model and

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how successful to achieve it. This edition provides readers with the most recent progress and novel solutions in artificial intelligence. This book aims at presenting the research results and solutions of applications in relevance with artificial intelligence technologies. We propose to researchers and practitioners some methods to advance the intelligent systems and apply artificial intelligence to specific or general purpose. This book consists of 13 contributions that feature fuzzy (r, s) -minimal pre- and \square -open sets, handling big cooccurrence matrices, Xie-Beni-type fuzzy cluster validation, fuzzy c-regression models, combination of genetic algorithm and ant colony

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optimization, building expert system, fuzzy logic and neural network, individual role adaptation for team sports, application of polynomial neural networks, recursive neuro-fuzzy algorithm for water management, application of interactive genetic algorithm, and Artificial Neural Network (ANN) model. This edition is published in original, peer reviewed contributions covering from initial design to final prototypes and verification.

Handbook of Research on Soft Computing and Nature-Inspired Algorithms

Applied Soft Computing Techniques for Renewable Energy

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Soft Computing Techniques in Engineering, Health,
Mathematical and Social Sciences

Advances in Soft Computing

Quantitative Logic and Soft Computing

*Soft Computing for Problem Solving SocProS
2017, Volume 2 Springer*

This book presents the necessary and essential backgrounds of fuzzy set theory and linear programming, particularly a broad range of common Fuzzy Linear Programming (FLP) models and related, convenient solution techniques. These models and methods

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belong to three common classes of fuzzy linear programming, namely: (i) FLP problems in which all coefficients are fuzzy numbers, (ii) FLP problems in which the right-hand-side vectors and the decision variables are fuzzy numbers, and (iii) FLP problems in which the cost coefficients, the right-hand-side vectors and the decision variables are fuzzy numbers. The book essentially generalizes the well-known solution algorithms used in linear programming to the fuzzy environment. Accordingly, it can be

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used not only as a textbook, teaching material or reference book for undergraduate and graduate students in courses on applied mathematics, computer science, management science, industrial engineering, artificial intelligence, fuzzy information processes, and operations research, but can also serve as a reference book for researchers in these fields, especially those engaged in optimization and soft computing. For textbook purposes, it also includes simple and illustrative examples to help readers who are

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new to the field.

The concept of soft computing is still in its initial stages of crystallization. Presently available books on soft computing are merely collections of chapters or articles about different aspects of the field. This book is the first to provide a systematic account of the major concepts and methodologies of soft computing, presenting a unified framework that makes the subject more accessible to students and practitioners. Particularly worthy of note is the inclusion of a wealth of

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information about neuro-fuzzy, neuro-genetic, fuzzy-genetic and neuro-fuzzy-genetic systems, with many illuminating applications and examples.

The contributions to this book cover a wide range of applications of Soft Computing to the chemical domain. The early roots of Soft Computing can be traced back to Lotfi Zadeh's work on soft data analysis [1] published in 1981. 'Soft Computing' itself became fully established about 10 years later, when the Berkeley Initiative in Soft

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Computing (SISC), an industrial liaison program, was put in place at the University of California - Berkeley. Soft Computing applications are characterized by their ability to:

- approximate many different kinds of real-world systems;*
- tolerate imprecision, partial truth, and uncertainty; and*
- learn from their environment. Such characteristics commonly lead to a better ability to match reality than other approaches can provide, generating solutions of low cost, high robustness, and tractability. Zadeh has argued that soft*

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computing provides a solid foundation for the conception, design, and application of intelligent systems employing its methodologies symbiotically rather than in isolation. There exists an implicit commitment to take advantage of the fusion of the various methodologies, since such a fusion can lead to combinations that may provide performance well beyond that offered by any single technique.

*Soft Computing in Software Engineering
Soft Computing Based Modeling in Intelligent*

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Systems

Soft Computing and Its Applications

Soft Computing in Textile Engineering

Pattern Recognition

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

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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

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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

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This book describes different mathematical modeling and soft computing techniques used to solve practical engineering problems. It gives an overview of the current state of soft computing techniques and describes the advantages and disadvantages of soft computing compared to traditional hard computing techniques. Through examples and case studies the editors demonstrate and describe how problems with inherent

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uncertainty can be addressed and eventually solved through the aid of numerical models and methods. The chapters address several applications and examples in bioengineering science, drug delivery, solving inventory issues, Industry 4.0, augmented reality and weather forecasting. Other examples include solving fuzzy-shortest-path problems by introducing a new distance and ranking functions. Because, in practice, problems arise with uncertain

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data and most of them cannot be solved exactly and easily, the main objective is to develop models that deliver solutions with the aid of numerical methods. This is the reason behind investigating soft numerical computing in dynamic systems. Having this in mind, the authors and editors have considered error of approximation and have discussed several common types of errors and their propagations. Moreover, they have explained the

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numerical methods, along with convergence and consistence properties and characteristics, as the main objectives behind this book involve considering, discussing and proving related theorems within the setting of soft computing. This book examines dynamic models, and how time is fundamental to the structure of the model and data as well as the understanding of how a process unfolds

- Discusses mathematical modeling with

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soft computing and the implementations of uncertain mathematical models • Examines how uncertain dynamic systems models include uncertain state, uncertain state space and uncertain state's transition functions • Assists readers to become familiar with many soft numerical methods to simulate the solution function's behavior This book is intended for system specialists who are interested in dynamic systems that operate at different time scales. The

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book can be used by engineering students, researchers and professionals in control and finite element fields as well as all engineering, applied mathematics, economics and computer science interested in dynamic and uncertain systems. Ali Ahmadian is a Senior Lecturer at the Institute of IR 4.0, The National University of Malaysia. Soheil Salahshour is an associate professor at Bahcesehir University.

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The book presents a clear understanding of a new type of computation system, the Cellular Neural Network (CNN), which has been successfully applied to the solution of many heavy computation problems, mainly in the fields of image processing and complex partial differential equations. The text describes how CNN will improve the soft-computation toolbox, and examines the many applications of soft computing to complex systems.

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This book constitutes the refereeds proceedings of the International Conference on High Performance Architecture and Grid Computing, HPAGC 2011, held in Chandigarh, India, in July 2011. The 87 revised full papers presented were carefully reviewed and selected from 240 submissions. The papers are organized in topical sections on grid and cloud computing; high performance architecture; information management and network

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security.

PRINCIPLES OF SOFT COMPUTING (With CD)
Engineering Design and Manufacturing

Soft Computing Methods for Practical
Environment Solutions
New Trends and Applications

This book offers a comprehensive overview of cutting-edge approaches for decision-making in hierarchical organizations. It presents soft-computing-based techniques, including fuzzy sets, neural networks, genetic algorithms and particle swarm optimization, and shows how these approaches can be effectively used to

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deal with problems typical of this kind of organization. After introducing the main classical approaches applied to multiple-level programming, the book describes a set of soft-computing techniques, demonstrating their advantages in providing more efficient solutions to hierarchical decision-making problems compared to the classical methods. Based on the book *Fuzzy and Multi-Level Decision Making* (Springer, 2001) by Lee E.S and Shih, H., this second edition has been expanded to include the most recent findings and methods and a broader spectrum of soft computing approaches. All the algorithms are presented in detail, together with a wealth of practical examples and solutions to real-world problems, providing students, researchers and

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professionals with a timely, practice-oriented reference guide to the area of interactive fuzzy decision making, multi-level programming and hierarchical optimization. This book offers a timely snapshot of soft computing methodologies and their applications to various problems related to sustainability, including electric energy consumption; fault diagnosis; vessel fuel consumption; determining the best sites for new malls; maritime port projects; and ad-hoc vehicular networks. Further, it demonstrates how metaheuristics and machine learning methods, fuzzy linear programming, neural networks, computing with words, linguistic models and other soft computing methods can be efficiently used to solve real-world problems. Intended as

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a practice-oriented guide for students, researchers, and professionals working at the interface between computer science, industrial engineering, naval engineering, agriculture, and sustainable development / climate change research, it provides readers with a set of intelligent solutions, helping them answer a range of emerging questions related to sustainability.

This volume, containing contributions by experts from all over the world, is a collection of 21 articles which present review and research material describing the evolution and recent developments of various pattern recognition methodologies, ranging from statistical, syntactic/linguistic, fuzzy-set-theoretic, neural, genetic-algorithmic and rough-set-theoretic to hybrid soft

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computing, with significant real-life applications. In addition, the book describes efficient soft machine learning algorithms for data mining and knowledge discovery. With a balanced mixture of theory, algorithms and applications, as well as up-to-date information and an extensive bibliography, Pattern Recognition: From Classical to Modern Approaches is a very useful resource.

Market_Desc: · B. Tech (UG) students ofü CSEü ITü ECE·
College Libraries· Research Scholars· Operational
Research· Management Sector Special Features: ·
Detailed explanation of soft computing concepts· Study
on various artificial neural network architecture·
Description on fuzzy logic techniques· Introduction to

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genetic algorithm and its types for solving optimization problems.· Numerous artificial neural network, fuzzy logic and genetic algorithm problems.· Implementation of soft computing techniques using C and C++.· Simulated solutions for soft computing concepts using MATLAB package.· Application case studies on soft computing techniques on emerging fields.· Various hybrid soft computing techniques.· New in this edition.· Certain topics have been added such as:ü Fundamentals of Genetic Algorithmsü Genetic Modelingü Integration of Neural Networks, Fuzzy Logic, and Genetic Algorithms.· A new chapter Hybrid Soft Computing Techniques has been added bringing the advantages of combining individual techniques.· 5 Sample Question Papers have been added

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at the end of the book. Accompanying CD contains ·
Power point presentations· Source Codes for Soft
Computing Techniques in C· MATLAB Source Code
Programs About The Book: In this book the basic
concepts of soft computing are dealt in detail with the
relevant information and knowledge available for
understanding the computing process. The various
neural network concepts are explained with examples,
highlighting the difference between various
architectures. Fuzzy logic techniques have been clearly
dealt with suitable examples. Genetic algorithm
operators and the various classifications have been
discussed in lucid manner, so that a beginner can
understand the concepts with minimal effort. The book

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can be used as a handbook as well as a guide for students of all engineering disciplines, soft computing research scholars, management sector, operational research area, computer applications and for various professionals who work in this area.

Techniques and Applications

Soft Computing

SocProS 2017, Volume 2

Classical and New Methods. Nonlinear Mathematical Models. Symmetry and Invariance Principles

Vol 2

"This publication presents a series of practical applications of different Soft Computing techniques

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to real-world problems, showing the enormous potential of these techniques in solving problems"--Provided by publisher.

This new volume explores a variety of modern techniques that deal with estimated models and give resolutions to complex real-life issues. Soft computing has played a crucial role not only with theoretical paradigms but is also popular for its pivotal role for designing a large variety of expert systems and artificial intelligence-based applications. Involving the concepts and practices of soft computing in conjunction with other frontier research

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domains, this book begins with the basics and goes on to explore a variety of modern applications of soft computing in areas such as approximate reasoning, artificial neural networks, Bayesian networks, big data analytics, bioinformatics, cloud computing, control systems, data mining, functional approximation, fuzzy logic, genetic and evolutionary algorithms, hybrid models, machine learning, metaheuristics, neuro fuzzy system, optimization, randomized searches, and swarm intelligence. This book will be helpful to a wide range of readers who wish to learn applications of soft computing

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approaches. It will be useful for academicians, researchers, students, and machine learning experts who use soft computing techniques and algorithms to develop cutting-edge artificial intelligence-based applications.

This book contains recent theoretical innovations and a comprehensive collection of industrial applications in the emerging field of Soft Computing. Soft computing is a new form of artificial intelligence and it consists of four core methodologies: Fuzzy Computing, Neuro Computing, Evolutionary Computation, and Probabilistic Computing. These

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individual techniques are clearly complementary or synergistic rather than competitive. Therefore, it is a common practice to combine two or three methodologies when solving complex problems. Also the systematic fusion of soft computing and hard computing is a highly potential alternative to be considered. Soft computing methodologies are suitable for various real-world applications, because the available information and system knowledge are often imprecise, un certain, or partially even incorrect. To handle such demanding conditions and obtain the required robustness with pure hard

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computing would typically be either very difficult or expensive. This book is a unique collection of technical articles providing a thorough overview of the state-of-the-art theory and industrial applications. The core articles on evolutionary computation, fuzzy computing, and neuro computing are of particular interest to researchers and practicing engineers. "This book provides a better understanding of Fuzzy set theory, Fuzzy logic and Neural Networks and various other techniques seem very well suited for modeling and controlling a real system. Energy is of major importance to civilization, because it is driving

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force which binds human race. The estimation of energy in the form of renewable and sustainable is one of the important aspects to understand the how resources are harnessed and to predict what might happen under various possible future conditions. Using available modelling techniques to generate the best algorithms, the objective is to determine the best solution in terms of comparing the performances of the solutions through different parameters for a specific case. Consumption of Fossil fuels at a rapid pace has generated an alarming situation and with the subsequent increase

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in the number of vehicle the pollution level has reached well beyond human's control. This is frightening enough to observe the fact that the pollution level has surpassed all records and the need of the hour is to find an alternate fuel which can really be of great assistance in reducing the exhaust emission and augment the performance parameters of engine. Major researches are carried out on various engines to draw closer towards a realistic solution. Experiments performed on various engines are considered to be time consuming and the expenses met to perform these experiments are too

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costly, so the need of soft computing techniques involved in this area. Soft computing can be better described as the process to find the solution to an inexact problem. Soft computing has showed lot of potential in giving the researchers the exact solution may be in case of validating or predicting the performance and emission parameters. Artificial Neural Network (ANN), Adaptive Neuro Fuzzy Inference system (ANFIS), Fuzzy Expert System (FES), Response Surface Methodology (RSM) and Support Vector Machine (SVM) are the various soft computing techniques widely used. This book

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focuses on to carry out the comprehensive review and various other experimental works of various researchers who have carried out the work on these various soft computing techniques on various engines with various alternative fuels On the basis of modelling techniques, time is saved to a great extent and the capital investment involved is comparably very low. Various modelling techniques are being readily used to predict the performance parameters for various engines and modelling techniques have become the readily available tool to compare and validate the experimental work being carried out by

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researchers to get accurate matching with the experimental data. The benefit of this issue will be at large in connecting with varieties of work done in the field of Biomass which includes wood and wood waste, municipal solid waste. Landfill gas and biogas. Ethanol, Biodiesel, Hydropower, Geothermal, Wind, Solar. Thus soft computing techniques are fast and reliable hence, they can be a substitute for conventional experiments"--

SocProS 2018, Volume 2

Soft Computing for Sustainability Science

Fuzzy and Multi-Level Decision Making: Soft

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Computing Approaches

Analysis and Design of Intelligent Systems Using
Soft Computing Techniques

Techniques and Studies

Advances in Soft Computing contains the most recent developments in the field of soft computing in engineering design and manufacture. The book comprises a selection of papers that were first presented in June 1998 at the 3rd On-line World Conference on Soft Computing in Engineering Design and Manufacturing. Amongst these are four

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invited papers by World-renowned researchers in the field. Soft computing is a collection of methodologies which aim to exploit tolerance for imprecision, uncertainty and partial truth to achieve tractability, robustness and low solution cost. The area of applications of soft computing is extensive. Principally the constituents of soft computing are: fuzzy computing, neuro-computing, genetic computing and probabilistic computing. The topics in this book are well focused on engineering design and

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manufacturing. This broad collection of 43 research papers, has been arranged into nine parts by the editors. These include: Design Support Systems, Intelligent Control, Data Mining and New Topics in EA basics. The papers on evolutionary design and optimisation are of particular interest. Innovative techniques are explored and the reader is introduced to new, highly advanced research results. The editors present a unique collection of papers that provide a comprehensive overview of current

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developments in soft computing research around the world.

Nature provides inspiration and guidance in the creation of techniques, applications and new technologies in the fields of artificial intelligence and soft computing. This book presents various practical applications of soft computing techniques in real-world situations and problems, aiming to show the enormous potential of such techniques in solving all kinds of problems. It explores the latest advances in these techniques in an extensive

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state-of-the-art review and a vast theoretical study. Ideal for students studying AI and researchers familiarizing themselves with such techniques, it offers recent and novel applications, helping expand and explore new areas of research.

If you are studying soft computing, intelligent machines or intelligent control then this book will give you the theory you need together with a vast array of examples and practical material, providing you with a thorough grounding in this exciting field.

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Practising professionals will find the introductory material, application oriented techniques and case studies especially helpful. Theory meets practice through numerous examples and solved real world problems. Comprehensive case studies demonstrate a wide range of applications across science and engineering. Extensive coverage of intelligent systems design including intelligent control and time series prediction.

Soft computing techniques have reached a

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significant level of recognition and acceptance from both the academic and industrial communities. The papers collected in this volume illustrate the depth of the current theoretical research trends and the breadth of the application areas in which soft computing methods are making contributions. This volume consists of forty six selected papers presented at the Fourth International Conference on Recent Advances in Soft Computing, which was held in Nottingham, United Kingdom on 12 and 13

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December 2002 at Nottingham Trent University. This volume is organized in five parts. The first four parts address mainly the fundamental and theoretical advances in soft computing, namely Artificial Neural Networks, Evolutionary Computing, Fuzzy Systems and Hybrid Systems. The fifth part of this volume presents papers that deal with practical issues and industrial applications of soft computing techniques. We would like to express our sincere gratitude to all the authors who submitted contributions for

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inclusion. We are also indebted to Janusz Kacprzyk for his - vices related to this volume. We hope you find the volume an interesting refl- tion of current theoretical and application based soft computing research.

Soft Computing Techniques for Engineering Optimization

Theory, Tools, and Applications

High Performance Architecture and Grid Computing

International Conference, HPAGC 2011,

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Chandigarh, India, July 19-20, 2011.

Proceedings

**Soft Computing Methods for Practical
Environment Solutions: Techniques and
Studies**

Soft computing and nature-inspired computing both play a significant role in developing a better understanding to machine learning. When studied together, they can offer new perspectives on the learning process of machines.

The Handbook of Research on Soft Computing and Nature-Inspired Algorithms is an essential source for the latest scholarly research on applications of nature-inspired

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computing and soft computational systems. Featuring comprehensive coverage on a range of topics and perspectives such as swarm intelligence, speech recognition, and electromagnetic problem solving, this publication is ideally designed for students, researchers, scholars, professionals, and practitioners seeking current research on the advanced workings of intelligence in computing systems.

This book is an introduction to some new fields in soft computing with its principal components of fuzzy logic, ANN and EA. The approach in this book is to provide an understanding of the soft computing field and to work

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through soft computing using examples. It also aims to integrate pseudo-code operational summaries and Matlab codes, to present computer simulation, to include real world applications and to highlight the distinctive work of human consciousness in machine.

Soft computing techniques are no longer limited to the arena of computer science. The discipline has an exponentially growing demand in other branches of science and engineering and even into health and social science. This book contains theory and applications of soft computing in engineering, health, and social and applied sciences. Different soft computing techniques such as

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artificial neural networks, fuzzy systems, evolutionary algorithms and hybrid systems are discussed. It also contains important chapters in machine learning and clustering. This book presents a survey of the existing knowledge and also the current state of art development through original new contributions from the researchers. This book may be used as a one-stop reference book for a broad range of readers worldwide interested in soft computing. In each chapter, the preliminaries have been presented first and then the advanced discussion takes place. Learners and researchers from a wide variety of backgrounds will find several useful tools and techniques

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to develop their soft computing skills. This book is meant for graduate students, faculty and researchers willing to expand their knowledge in any branch of soft computing. The readers of this book will require minimum prerequisites of undergraduate studies in computation and mathematics.

Rapid advancements in the application of soft computing tools and techniques have proven valuable in the development of highly scalable systems and resulted in brilliant applications, including those in biometric identification, interactive voice response systems, and data mining. Although many resources on the subject

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adequately cover the theoretic concepts, few provide clear insight into practical application. Filling this need, Real Life Applications of Soft Computing explains such applications, including the underlying technology and its implementation. While these systems initially seem complex, the authors clearly demonstrate how they can be modeled, designed, and implemented. Written in a manner that makes it accessible to novices, the book begins by covering the theoretical foundations of soft computing. It supplies a concise explanation of various models, principles, algorithms, tools, and techniques, including artificial neural networks, fuzzy systems, evolutionary

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algorithms, and hybrid algorithms. Supplying in-depth exposure to real life systems, the text provides: Multi-dimensional coverage supported by references, figures, and tables Warnings about common pitfalls in the implementation process, as well as detailed examinations of possible solutions A timely account of developments in various areas of application Solved examples and exercises in each chapter Detailing a wide range of contemporary applications, the text includes coverage of those in biometric systems, including physiological and behavioral biometrics. It also examines applications in legal threat assessment, robotic path planning, and

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navigation control. The authors consider fusion methods in biometrics and bioinformatics and also provide effective disease identification techniques. Complete with algorithms for robotic path planning, the book addresses character recognition and presents the picture compression technique by using a customized hybrid algorithm. The authors conclude with a discussion of parallel architecture for artificial neural networks and supply guidelines for creating and implementing effective soft computing designs.

Advanced Soft Computing Techniques in Data Science,
IoT and Cloud Computing

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Artificial Intelligence and Soft Computing for Beginners,
2nd Edition

From Classical to Modern Approaches

Soft Computing in Artificial Intelligence

Theoretical Advances and Applications of Fuzzy Logic
and Soft Computing

The course of Artificial Intelligence is taken by all engineering undergraduate and postgraduate students pursuing computer science. Apart from this, it is a popular elective in almost all other branches of engineering. It is also a field chosen for research by many doctoral students. This book has in-depth detail

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illustration of all the chapters of Artificial Intelligence (AI) with Soft Computing, covering the syllabus of WBUT, Gitam, JNTU, NIT and few different universities. During the course of teaching Artificial Intelligence, the author had found that no textbook covers both Artificial intelligence (AI) with intelligent systems (IS) and soft computing in a comprehensive manner. This book provides a comprehensive coverage of the fundamental concepts and techniques in Artificial Intelligence and Soft Computing with mathematical in depth explanation. The main emphasis is on the solution of real world problems using the latest AI techniques. During teaching

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artificial intelligence, author realized that the basic text books do not have an organized content according to the syllabus. In this book all the chapters are organized properly and contain a complete coverage. The sequence of the chapters has been set in a manner which would be very easy for the students to understand. The main importance of this book is on the solution of many real world problems. Each chapter contains multiple choice questions with answer and possible explanation. Also some important solutions and answers at the end as "Take a look to be more acquainted with." In addition, modern and current topic in AI for example Pattern Recognition,

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Data Clustering Algorithm, Genetic Algorithm with Data Clustering method, Swarm Intelligence, Tabu Search, Ant Colony Optimization are discussed in details. These concepts may motivate students to do projects .This book contains information about programming languages and the proper syntax with example is provided which may help students to practically apply this programming concepts. Mathematical explanation to understand the concept in detail about single & multi objective Genetic Algorithm, Neural Network, Fuzzy Logic is provided. The basic coverage of each and every chapter is mentioned before the chapter as "chapter utility." This

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book has been designed in such a manner so that it becomes very easy to understand the language and comprehend not only for computer science department student but also for non departmental student as well. The book "Soft Computing Based Modeling in Intelligent Systems" contains the - tended works originally presented at the IEEE International Workshop SOFA 2005 and additional papers. SOFA, an acronym for SOFt computing and Applications, is an international wo- shop intended to advance the theory and applications of intelligent systems and soft computing. Lotfi Zadeh, the inventor of fuzzy logic, has suggested the term "Soft Computing." He created the

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Berkeley Initiative of Soft Computing (BISC) to connect researchers working in these new areas of AI. Professor Zadeh participated actively in our workshop. Soft Computing techniques are tolerant to imprecision, uncertainty and partial truth. Due to the large variety and complexity of the domain, the constituting methods of Soft Computing are not competing for a comprehensive ultimate solution. Instead they are complementing each other, for dedicated solutions adapted to each specific problem. Hundreds of concrete applications are already available in many domains. Model based approaches offer a very challenging way to integrate a priori knowledge into procedures. Due

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to their flexibility, robustness, and easy interpretability, the soft computing applications will continue to have an exceptional role in our technologies. The applications of Soft Computing techniques in emerging research areas show its maturity and usefulness. The IEEE International Workshop SOFA 2005 held Szeged-Hungary and Arad-Romania in 2005 has led to the publication of these two edited volumes. This volume contains Soft Computing methods and applications in modeling, optimisation and prediction.

Artificial intelligence has, traditionally focused on solving human-centered problems like natural

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language processing or common-sense reasoning. On the other hand, for a while now soft computing has been applied successfully in areas like pattern recognition, clustering, or automatic control. The papers in this book explore the possibility of bringing these two areas together. This book is unique in the way it concentrates on building intelligent software systems by combining methods from diverse disciplines, such as fuzzy set theory, neuroscience, agent technology, knowledge discovery, and symbolic artificial intelligence. The first part of the book focuses on foundational aspects and future directions; the second part provides the reader with an overview of

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recently developed software tools for building flexible intelligent systems; the final section studies developed applications in various fields.

Market_Desc: · B. Tech (UG) students of CSE, IT, ECE·
College Libraries· Research Scholars· Operational
Research· Management Sector Special Features: Dr. S.
N. Sivanandam has published 12 books· He has
delivered around 150 special lectures of different
specialization in Summer/Winter school and also in
various Engineering colleges· He has guided and co
guided 30 PhD research works and at present 9 PhD
research scholars are working under him· The total
number of technical publications in

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International/National Journals/Conferences is around 700. He has also received Certificate of Merit 2005-2006 for his paper from The Institution of Engineers (India). He has chaired 7 International Conferences and 30 National Conferences. He is a member of various professional bodies like IE (India), ISTE, CSI, ACS and SSI. He is a technical advisor for various reputed industries and engineering institutions. His research areas include Modeling and Simulation, Neural Networks, Fuzzy Systems and Genetic Algorithm, Pattern Recognition, Multidimensional system analysis, Linear and Nonlinear control system, Signal and Image

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processing, Control System, Power system, Numerical methods, Parallel Computing, Data Mining and Database Security About The Book: This book is meant for a wide range of readers who wish to learn the basic concepts of soft computing. It can also be helpful for programmers, researchers and management experts who use soft computing techniques. The basic concepts of soft computing are dealt in detail with the relevant information and knowledge available for understanding the computing process. The various neural network concepts are explained with examples, highlighting the difference between various architectures. Fuzzy logic techniques have been

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clearly dealt with suitable examples. Genetic algorithm operators and the various classifications have been discussed in lucid manner, so that a beginner can understand the concepts with minimal effort.

Techniques and its Applications in Electrical
Engineering

Applied Soft Computing

Fuzzy Linear Programming: Solution Techniques and
Applications

Intelligent Systems and Soft Computing

Soft Computing and Intelligent Systems Design

***Soft computing is playing an increasing role in the
study of complex systems in science and***

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engineering. There is a large spectrum of successful applications of soft computing in very different applications domains such as aerospace, communication, consumer appliances, electric power systems, process engineering, transportation, and manufacturing automation and robotics. It has taken a while to bring the early ideas of soft computing to an area and a discipline that seems to be more than appropriate for that. Here it is! This book studies SOFT computing in SOFTWARE engineering environment. The book is HARD in terms of its results. It covers a range of core topics from software engineering that are soft from its very nature: selection of components, software design,

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software reuse, software cost estimation and software processes. Soft computing differs from conventional (hard) computing in its ability to be tolerant of imprecision, uncertainty, partial truth, and approximation. The guiding principle of soft computing is: Exploit the tolerance for imprecision, uncertainty, partial truth, and approximation to achieve tractability, robustness and low solution cost. The role model for soft computing is the human mind. This seems to be a natural fit with software engineering, a human-based development activity based on sound engineering principles. A recent survey by researchers reveals that "Software Engineering research tends to be quite self-

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contained, not relying on other disciplines for its thinking".

This two-volume book presents outcomes of the 7th International Conference on Soft Computing for Problem Solving, SocProS 2017. This conference is a joint technical collaboration between the Soft Computing Research Society, Liverpool Hope University (UK), the Indian Institute of Technology Roorkee, the South Asian University New Delhi and the National Institute of Technology Silchar, and brings together researchers, engineers and practitioners to discuss thought-provoking developments and challenges in order to select potential future directions The book presents the

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latest advances and innovations in the interdisciplinary areas of soft computing, including original research papers in the areas including, but not limited to, algorithms (artificial immune systems, artificial neural networks, genetic algorithms, genetic programming, and particle swarm optimization) and applications (control systems, data mining and clustering, finance, weather forecasting, game theory, business and forecasting applications). It is a valuable resource for both young and experienced researchers dealing with complex and intricate real-world problems for which finding a solution by traditional methods is a difficult task. Soft Computing in Industrial Applications

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***Computational Intelligence: Soft Computing and
Fuzzy-Neuro Integration with Applications
Applications and Science in Soft Computing
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