Fuzzy Logic With Engineering Applications By Timothy J Ross Free

Fuzzy logic techniques have had extraordinary growth in various engineering systems. The developments in engineering sciences have caused apprehension in modern years due to high-tech industrial processes with ever-increasing levels of complexity. Advanced Fuzzy Logic Approaches in Engineering Science provides innovative insights into a comprehensive range of soft fuzzy logic techniques applied in various fields of engineering problems like fuzzy sets theory, adaptive neuro fuzzy inference system, and hybrid fuzzy logic genetic algorithms belief networks in industrial and engineering settings. The content within this publication represents the work of particle swarms, fuzzy computing, and rough sets. It is a vital reference source for engineers, research scientists, academicians, and graduate-level students seeking coverage on topics centered on the applications of fuzzy logic in high-tech industrial processes.

This book presents a mathematically-based introduction into the fascinating topic of Fuzzy Sets and Fuzzy Logic and might be used as textbook at both undergraduate and graduate levels and also as reference guide for mathematician, scientists or engineers who would like to get an insight into Fuzzy Logic. Fuzzy Sets have been introduced by Lotfi Zadeh in 1965 and since then, they have been used in many applications. As a consequence, there is a vast literature on the practical applications of fuzzy sets, while

theory has a more modest coverage. The main purpose of the present book is to reduce this gap by providing a theoretical introduction into Fuzzy Sets based on Mathematical Analysis and Approximation Theory. Well-known applications, as for example fuzzy control, are also discussed in this book and placed on new ground, a theoretical foundation. Moreover, a few advanced chapters and several new results are included. These comprise, among others, a new systematic and constructive approach for fuzzy inference systems of Mamdani and Takagi-Sugeno types, that investigates their approximation capability by providing new error estimates.

In the early 1970s, fuzzy systems and fuzzy control theories added a new dimension to control systems engineering. From its beginnings as mostly heuristic and somewhat ad hoc, more recent and rigorous approaches to fuzzy control theory have helped make it an integral part of modern control theory and produced many exciting results. Yesterday's "art

Since its inception, fuzzy logic has attracted an incredible amount of interest, and this interest continues to grow at an exponential rate. As such, scientists, researchers, educators and practitioners of fuzzy logic continue to expand on the applicability of what and how fuzzy can be utilised in the real-world. In this book, the authors present key application areas where fuzzy has had significant success. The chapters cover a plethora of application domains, proving credence to the versatility and robustness of a fuzzy approach. A better understanding of fuzzy will ultimately allow for a better

appreciation of fuzzy. This book provides the reader with a varied range of examples to illustrate what fuzzy logic can be capable of and how it can be applied. The text will be ideal for individuals new to the notion of fuzzy, as well as for early career academics who wish to further expand on their knowledge of fuzzy applications. The book is also suitable as a supporting text for advanced undergraduate and graduate-level modules on fuzzy logic, soft computing, and applications of AI. Dr. Jenny Carter is a Senior Lecturer in the Department of Computer Science at the University of Huddersfield, UK. Her other publications include the Springer books, Transnational Higher Education in Computing Courses, and Higher Education Computer Science. Dr. Tianhua Chen is a Senior Lecturer in Artificial Intelligence with the Department of Computer Science at the University of Huddersfield. Dr. Francisco Chiclana is a Professor of Computational Intelligence and Decision Making in the School of Computer Science and Informatics at De Montfort University, Leicester, UK. Dr. Arjab Singh Khuman is a Senior Lecturer and Researcher at the same institution.

The present book contains 20 articles collected from amongst the 53 total submitted manuscripts for the Special Issue "Fuzzy Sets, Fuzzy Loigic and Their Applications" of the MDPI journal Mathematics. The articles, which appear in the book in the series in which they were accepted, published in Volumes 7 (2019) and 8 (2020) of the journal, cover a wide range of topics connected to the theory and applications of fuzzy systems and their extensions and generalizations. This range includes, among others,

management of the uncertainty in a fuzzy environment; fuzzy assessment methods of human-machine performance; fuzzy graphs; fuzzy topological and convergence spaces; bipolar fuzzy relations; type-2 fuzzy; and intuitionistic, interval-valued, complex, picture, and Pythagorean fuzzy sets, soft sets and algebras, etc. The applications presented are oriented to finance, fuzzy analytic hierarchy, green supply chain industries, smart health practice, and hotel selection. This wide range of topics makes the book interesting for all those working in the wider area of Fuzzy sets and systems and of fuzzy logic and for those who have the proper mathematical background who wish to become familiar with recent advances in fuzzy mathematics, which has entered to almost all sectors of human life and activity.

An introductory book that provides theoretical, practical,and application coverage of the emerging field of type-2 fuzzylogic control Until recently, little was known about type-2 fuzzy controllersdue to the lack of basic calculation methods available for type-2fuzzy sets and logic—and many different aspects of type-2fuzzy control still needed to be investigated in order to advancethis new and powerful technology. This self-contained referencecovers everything readers need to know about the growing field. Written with an educational focus in mind, Introduction toType-2 Fuzzy Logic Control: Theory and Applications uses acoherent structure and uniform mathematical notations to linkchapters that are closely related, reflecting the book'scentral themes: analysis and design of type-2 fuzzy controlsystems. The book includes worked examples,

experiment andsimulation results, and comprehensive reference materials. The bookalso offers downloadable computer programs from an associatedwebsite. Presented by world-class leaders in type-2 fuzzy logic control,Introduction to Type-2 Fuzzy Logic Control: Is useful for any technical person interested in learningtype-2 fuzzy control theory and its applications Offers experiment and simulation results via downloadablecomputer programs Features type-2 fuzzy logic background chapters to make thebook self-contained Provides an extensive literature survey on both fuzzy logic andrelated type-2 fuzzy control Introduction to Type-2 Fuzzy Logic Control is aneasy-to-read reference book suitable for engineers, researchers,and graduate students who want to gain deep insight into type-2fuzzy logic control.

Résumé : With numerous examples and end-of-chapter problems, this book is essential reading for graduates and senior undergraduate students in civil, chemical, mechanical and electrical engineering as wells as researchers and practitioners working with fuzzy logic in industry. --

This book introduces a dynamic, on-line fuzzy inference system. In this system membership functions and control rules are not determined until the system is applied and each output of its lookup table is calculated based on current inputs. The book describes the real-world uses of new fuzzy techniques to simplify readers' tuning processes and enhance the performance of their control systems. It further contains application examples.

This book introduces readers to fundamental concepts in fuzzy logic. It describes the necessary theoretical background and a number of basic mathematical models. Moreover, it makes them familiar with fuzzy control, an important topic in the engineering field. The book offers an unconventional introductory textbook on fuzzy logic, presenting theory together with examples and not always following the typical mathematical style of theorem-corollaries. Primarily intended to support engineers during their university studies, and to spark their curiosity about fuzzy logic and its applications, the book is also suitable for self-study, providing a valuable resource for engineers and professionals who deal with imprecision and non-random uncertainty in real-world applications. This volume covers the integration of fuzzy logic and expert systems. A vital resource in the field, it includes techniques for applying fuzzy systems to neural networks for modeling and control, systematic design procedures for realizing fuzzy neural systems, techniques for the design of rule-based expert systems using the massively parallel processing capabilities of neural networks, the transformation of neural systems into rule-based expert systems, the characteristics and relative merits of integrating fuzzy sets, neural networks, genetic algorithms, and rough sets, and applications to system identification and control as well as nonparametric, nonlinear estimation. Practitioners,

researchers, and students in industrial, manufacturing, electrical, and mechanical engineering, as well as computer scientists and engineers will appreciate this reference source to diverse application methodologies. Fuzzy system techniques applied to neural networks for modeling and control Systematic design procedures for realizing fuzzy neural systems Techniques for the design of rule-based expert systems Characteristics and relative merits of integrating fuzzy sets, neural networks, genetic algorithms, and rough sets System identification and control Nonparametric, nonlinear estimation Practitioners, researchers, and students in industrial, manufacturing, electrical, and mechanical engineering, as well as computer scientists and engineers will find this volume a unique and comprehensive reference to these diverse application methodologies Fuzzy sets and fuzzy logic are powerful mathematical tools for modeling and controlling uncertain systems in industry, humanity, and nature; they are facilitators for approximate reasoning in decision making in the absence of complete and precise information. Their role is significant when applied to complex phenomena not easily described by traditional mathematics.The unique feature of the book is twofold: 1) It is the first introductory course (with examples and exercises) which brings in a systematic way fuzzy sets and fuzzy logic into the educational university and college system. 2) It is designed to serve as a

basic text for introducing engineers and scientists from various fields to the theory of fuzzy sets and fuzzy logic, thus enabling them to initiate projects and make applications.

Fuzzy logic has become an important tool for a number of different applications ranging from the control of engineering systems to artificial intelligence. In this concise introduction, the author presents a succinct guide to the basic ideas of fuzzy logic, fuzzy sets, fuzzy relations, and fuzzy reasoning, and shows how they may be applied. The book culminates in a chapter which describes fuzzy logic control: the design of intelligent control systems using fuzzy if-then rules which make use of human knowledge and experience to behave in a manner similar to a human controller. Throughout, the level of mathematical knowledge required is kept basic and the concepts are illustrated with numerous diagrams to aid in comprehension. As a result, all those curious to know more about fuzzy concepts and their real-world application will find this a good place to start.

This book explores recent developments in the theoretical foundations and novel applications of general and interval type-2 fuzzy sets and systems, including: algebraic properties of type-2 fuzzy sets, geometric-based definition of type-2 fuzzy set operators, generalizations of the continuous KM algorithm, adaptiveness and novelty of interval type-2 fuzzy logic controllers, relations

between conceptual spaces and type-2 fuzzy sets, type-2 fuzzy logic systems versus perceptual computers; modeling human perception of real world concepts with type-2 fuzzy sets, different methods for generating membership functions of interval and general type-2 fuzzy sets, and applications of interval type-2 fuzzy sets to control, machine tooling, image processing and diet. The applications demonstrate the appropriateness of using type-2 fuzzy sets and systems in real world problems that are characterized by different degrees of uncertainty. Fuzzy control methods are critical for meeting the demands of complex nonlinear systems. They bestow robust, adaptive, and self-correcting character to complex systems that demand high stability and functionality beyond the capabilities of traditional methods. A thorough treatise on the theory of fuzzy logic control is out of place on the design bench. That is why Fuzzy Controller Design: Theory and Applications offers laboratory- and industry-tested algorithms, techniques, and formulations of real-world problems for immediate implementation. With surgical precision, the authors carefully select the fundamental elements of fuzzy logic control theory necessary to formulate effective and efficient designs. The book supplies a springboard of knowledge, punctuated with examples worked out in MATLAB®/SIMULINK®, from which newcomers to the field can dive directly into applications. It systematically covers the design of hybrid, adaptive, and self-

learning fuzzy control structures along with strategies for fuzzy controller design suitable for on-line and off-line operation. Examples occupy an entire chapter, with a section devoted to the simulation of an electro-hydraulic servo system. The final chapter explores industrial applications with emphasis on techniques for fuzzy controller implementation and different implementation platforms for various applications. With proven methods based on more than a decade of experience, Fuzzy Controller Design: Theory and Applications is a concise guide to the methodology, design steps, and formulations for effective control solutions. An Introduction to Fuzzy Logic Applications in Intelligent Systems consists of a collection of chapters written by leading experts in the field of fuzzy sets. Each chapter addresses an area where fuzzy sets have been applied to situations broadly related to intelligent systems. The volume provides an introduction to and an overview of recent applications of fuzzy sets to various areas of intelligent systems. Its purpose is to provide information and easy access for people new to the field. The book also serves as an excellent reference for researchers in the field and those working in the specifics of systems development. People in computer science, especially those in artificial intelligence, knowledge-based systems, and intelligent systems will find this to be a valuable sourcebook. Engineers, particularly control engineers, will also have a strong interest in this book. Finally, the book will be of interest to researchers working in

decision support systems, operations research, decision theory, management science and applied mathematics. An Introduction to Fuzzy Logic Applications in Intelligent Systems may also be used as an introductory text and, as such, it is tutorial in nature. What is fuzzy logic?--a system of concepts and methods for exploring modes of reasoning that are approximate rather than exact. While the engineering community has appreciated the advances in understanding using fuzzy logic for quite some time, fuzzy logic's impact in non-engineering disciplines is only now being recognized. The authors of Fuzzy Logic in Geology attend to this growing interest in the subject and introduce the use of fuzzy set theory in a style geoscientists can understand. This is followed by individual chapters on topics relevant to earth scientists: sediment modeling, fracture detection, reservoir characterization, clustering in geophysical data analysis, ground water movement, and time series analysis. George Klir is the Distinguished Professor of Systems Science and Director of the Center for Intelligent Systems, Fellow of the IEEE and IFSA, editor of nine volumes, editorial board member of 18 journals, and author or co-author of 16 books Foreword by the inventor of fuzzy logic-- Professor Lotfi Zadeh

"This book studies recent theoretical advances of fuzzy sets and numbers, fuzzy systems, fuzzy logic and their generalizations/extensions (e.g. intuitionistic fuzzy sets, neutrosophic sets, soft sets, rough sets, grey system theory etc.), as well as applications of them to science, technology and everyday life"--

Special Features: · New edition of a classic text is brought up-to-date with the latest
advances in the area of fuzzy logic· Includes abundant new illustrations and examples
using MATLAB code constituting an invaluable tool for students as well as for self-study
by practicing engineers.· Introduces new material on expansions of the MLFE method
using genetic algorithms, cognitive mapping, fuzzy agent-based models and total
uncertainty.· Features completely revised end--of --chapter problems.· Companion
website with MATLAB code examples and instructors solutions set. About The Book:
This new edition features the latest advances in the field including material on
expansion of the MLFE method using genetic algorithms, cognitive mapping, fuzzy
agent-based models and total uncertainty. Redundant or obsolete topics have been
removed, resulting in a more concise yet inclusive text that will ensure the book retains
its broad appeal at the forefront of the literature.Fuzzy Logic with Engineering
Applications, 3rd Edition is oriented mainly towards methods and techniques. Every
chapter has been revised, featuring new illustrations and examples throughout.
Supporting MATLAB code is downloadable at www.wileyeurope.com/go/fuzzylogic.
This will benefit student learning in all basic operations, the generation of membership
functions, and the specialized applications in the latter chapters of the book, providing
an invaluable tool for students as well as for self-study by practicing engineers.
Fuzzy Logic: State of the Art covers a wide range of both theory and applications of
fuzzy sets, ranging from mathematical basics, through artificial intelligence, computer

management and systems science to engineering applications. Fuzzy Logic will be of interest to researchers working in fuzzy set theory and its applications.

This is truly an interdisciplinary book for knowledge workers in business, finance, management and socio-economic sciences based on fuzzy logic. It serves as a guide to and techniques for forecasting, decision making and evaluations in an environment involving uncertainty, vagueness, impression and subjectivity. Traditional modeling techniques, contrary to fuzzy logic, do not capture the nature of complex systems especially when humans are involved. Fuzzy logic uses human experience and judgement to facilitate plausible reasoning in order to reach a conclusion. Emphasis is on applications presented in the 27 case studies including Time Forecasting for Project Management, New Product Pricing, and Control of a Parasit-Pest System.

Fuzzy logic has vast applications in power and electrical engineering. This collection is the first book to cover research advancements in the application of fuzzy logic in the planning and operation of smart grids. A global group of researchers and scholars present innovative approaches to fuzzy-based smart grid planning and operation, cover theoretical concepts and experimental results of the application of fuzzy-based techniques, and define and apply these techniques to deal with smart grid issues. Applications of Fuzzy Logic in Planning and Operation of Smart Grids is an ideal resource for researchers on the theory and application of fuzzy logic, practicing engineers working in electrical power engineering and power system planning, and post-

graduates and students in advanced graduate-level courses. The first book to cover fuzzy logic in planning and operation of smart grids; Defines and applies fuzzy-based techniques; Covers theoretical concepts and applications.

Mathematical Modeling using Fuzzy Logic has been a dream project for the author. Fuzzy logic provides a unique method of approximate reasoning in an imperfect world. This text is a bridge to the principles of fuzzy logic through an application-focused approach to selected topics in engineering and management. The many examples point to the richer solutions obtained through fuzzy logic and to the possibilities of much wider applications. There are relatively very few texts available at present in fuzzy logic applications. The style and content of this text is complementary to those already available. New areas of application, like application of fuzzy logic in modeling of sustainability, are presented in a graded approach in which the underlying concepts are first described. The text is broadly divided into two parts: the first treats processes, materials, and system applications related to fuzzy logic, and the second delves into the modeling of sustainability with the help of fuzzy logic. This book offers comprehensive coverage of the most essential topics, including: Treating processes, materials, system applications related to fuzzy logic Highlighting new areas of application of fuzzy logic Identifying possibilities of much wider applications of fuzzy logic Modeling of sustainability with the help of fuzzy logic The level enables a selection of the text to be made for the substance of undergraduate-, graduate-, and postgraduate-level courses.

There is also sufficient volume and quality for the basis of a postgraduate course. A more restricted and judicious selection can provide the material for a professional short course and various university-level courses.

After an introductory chapter explaining recent applications of fuzzy sets in IE, this book explores the seven major areas of IE to which fuzzy set theory can contribute: Control and Reliability, Engineering Economics and Investment Analysis, Group and Multi-criteria Decision-making, Human Factors Engineering and Ergonomics, Manufacturing Systems and Technology Management, Optimization Techniques, and Statistical Decision-making. Under these major areas, every chapter includes didactic numerical applications.

Explore the diverse electrical engineering application of polymer composite materials with this in-depth collection edited by leaders in the field Polymer Composites for Electrical Engineering delivers a comprehensive exploration of the fundamental principles, state-of-the-art research, and future challenges of polymer composites. Written from the perspective of electrical engineering applications, like electrical and thermal energy storage, high temperature applications, fire retardance, power cables, electric stress control, and others, the book covers all major application branches of these widely used materials. Rather than focus on polymer composite materials themselves, the distinguished editors have chosen to collect contributions from industry leaders in the area of real and practical electrical engineering applications of polymer

composites. The books relevance will only increase as advanced polymer composites receive more attention and interest in the area of advanced electronic devices and electric power equipment. Unique amongst its peers, Polymer Composites for Electrical Engineering offers readers a collection of practical and insightful materials that will be of great interest to both academic and industrial audiences. Those resources include: A comprehensive discussion of glass fiber reinforced polymer composites for power equipment, including GIS, bushing, transformers, and more) Explorations of polymer composites for capacitors, outdoor insulation, electric stress control, power cable insulation, electrical and thermal energy storage, and high temperature applications A treatment of semi-conductive polymer composites for power cables In-depth analysis of fire-retardant polymer composites for electrical engineering An examination of polymer composite conductors Perfect for postgraduate students and researchers working in the fields of electrical, electronic, and polymer engineering, Polymer Composites for Electrical Engineering will also earn a place in the libraries of those working in the areas of composite materials, energy science and technology, and nanotechnology. Fuzzy Logic for Embedded Systems Applications, by a recognized expert in the field, covers all the basic theory relevant to electronics design, with particular emphasis on embedded systems, and shows how the techniques can be applied to shorten design cycles and handle logic problems that are tough to solve using conventional linear techniques. All the latest advances in the field aree discussed and practical circuit

design examples presented. Fuzzy logic has been found to be particularly suitable for many embedded control applications. The intuitive nature of the fuzzy-based system design saves engineers time and reduces costs by shortening product development cycles and making system maintenance and adjustments easier. Yet despite its wide acceptance-and perhaps because of its name-it is still misunderstood and feared by many engineers. There is a need for embedded systems designers-both hardware and software-to get up to speed on the principles and applications of fuzzy logic in order to ascertain when and how to use them appropriately. Fuzzy Logic for Embedded Systems Applications provides practical guidelines for designing electronic circuits and devices for embedded systems using fuzzy-based logic. It covers both theory and applications with design examples. * Unified approach to fuzzy electronics from an engineering point of view * Easy to follow with plenty of examples * Review and evaluation of free resources

Fuzzy logic provides a unique method of approximate reasoning in an imperfect world. This text is a bridge to the principles of fuzzy logic through an application-focused approach to selected topics in Engineering and Management. The many examples point to the richer solutions obtained through fuzzy logic and to the possibilities of much wider applications. There are relatively few texts available at present in fuzzy logic applications. The style and content of this text is complementary to those already available. New areas of application are presented in a graded approach in which the

underlying concepts are first described. The text is broadly divided into two parts which treat Processes and Materials and also System Applications. The level enables a selection of the text to be made for the substance of a senior undergraduate level course. There is also sufficient volume and quality for the basis of a postgraduate course. A more restricted and judicious selection can provide the material for a professional short course.

A First Course in Fuzzy Logic, Third Edition continues to provide the ideal introduction to the theory and applications of fuzzy logic. This best-selling text provides a firm mathematical basis for the calculus of fuzzy concepts necessary for designing intelligent systems and a solid background for readers to pursue further studies and real-world applications. New in the Third Edition: A section on type-2 fuzzy sets - a topic that has received much attention in the past few years Additional material on copulas and t-norms More discussions on generalized modus ponens and the compositional rule of inference Complete revision to the chapter on possibility theory Significant expansion of the chapter on fuzzy integrals Many new exercises With its comprehensive updates, this new edition presents all the background necessary for students and professionals to begin using fuzzy logic in its many-and rapidly growing-applications in computer science, mathematics, statistics, and engineering.

The emergence of fuzzy logic and its applications has dramatically changed the face of industrial control engineering. Over the last two decades, fuzzy logic has allowed

control engineers to meet and overcome the challenges of developing effective controllers for increasingly complex systems with poorly defined dynamics. Today's engineers need a working knowledge of the principles and techniques of fuzzy logic-Intelligent Control provides it. The author first introduces the traditional control techniques and contrasts them with intelligent control. He then presents several methods of representing and processing knowledge and introduces fuzzy logic as one such method. He highlights the advantages of fuzzy logic over other techniques, indicates its limitations, and describes in detail a hierarchical control structure appropriate for use in intelligent control systems. He introduces a variety of applications, most in the areas of robotics and mechatronics but with others including air conditioning and process/production control. One appendix provides discussion of some advanced analytical concepts of fuzzy logic, another describes a commercially available software system for developing fuzzy logic application. Intelligent Control is filled with worked examples, exercises, problems, and references. No prior knowledge of the subject nor advanced mathematics are needed to comprehend much of the book, making it well-suited as a senior undergraduate or first-year graduate text and a convenient reference tool for practicing professionals.

Fuzzy technology has emerged as one of the most exciting new concepts available. Fuzzy Logic and its Applications... covers a wide range of the theory and applications of fuzzy logic and related systems, including industrial applications of fuzzy technology,

implementing human intelligence in machines and systems. There are four main themes: intelligent systems, engineering, mathematical foundations, and information sciences. Both academics and the technical community will learn how and why fuzzy logic is appreciated in the conceptual, design and manufacturing stages of intelligent systems, gaining an improved understanding of the basic science and the foundations of human reasoning.

The first edition of Fuzzy Logic with Engineering Applications (1995) was the first classroom text for undergraduates in the field. Now updated for the second time, this new edition features the latest advances in the field including material on expansion of the MLFE method using genetic algorithms, cognitive mapping, fuzzy agent-based models and total uncertainty. Redundant or obsolete topics have been removed, resulting in a more concise yet inclusive text that will ensure the book retains its broad appeal at the forefront of the literature. Fuzzy Logic with Engineering Applications, 3rd Edition is oriented mainly towards methods and techniques. Every chapter has been revised, featuring new illustrations and examples throughout. Supporting MATLAB code is downloadable at www.wileyeurope.com/go/fuzzylogic. This will benefit student learning in all basic operations, the generation of membership functions, and the specialized applications in the latter chapters of the book, providing an invaluable tool for students as well as for self-study by practicing engineers.

FUZZY LOGIC WITH ENGINEERING APPLICATIONS, 3RD EDJohn Wiley & Sons

Fuzzy logic is a way of thinking that is responsive to human zeal to unveil uncertainty and deal with social paradoxes emerging from it. In this book a number of articles illustrate various social applications to fuzzy logic. The engineering part of the book contains a number of papers, devoted to the description of fuzzy engineering design methodologies. In order to share the experience gained we select papers describing not the application result only but the way how this result has been obtained, that is explaining the design procedures. The potential readership of this book includes researchers and students, workers and engineers in both areas of social and engineering studies. It can be used as a handbook and textbook also. The book includes some examples of real fuzzy engineering.

With low computational complexity and relatively short development time, Fuzzy Logic is an indispensable tool for engineering applications. The field is growing at an unprecedented rate, and there is a need for a book that describes essential tools, applications, examples, and perspectives in the field of fuzzy learning. The editors of Fuzzy Learning and Applications fill this need, providing an essential book for researchers, scientists, and engineers alike. Organized into four parts, this book starts with the simplest learning method and gradually arrives at the most complex. First, it summarizes all the symbols and formulae used in the succeeding chapters and presents a historical overview of fuzzy learning. Next, it deals with current techniques, ranging from deterministic to hybrid methods. It then illustrates the enormous number of

possibilities offered by fuzzy learning. Finally, it covers hardware dedicated to fuzzy learning, from digital to analog designs and implementations. With Fuzzy Learning and Applications, readers will discover the enormous possibilities fuzzy learning offers. This book is a guide for students, researchers, and practitioners to the latest developments in fuzzy hybrid computing in construction engineering and management. It discusses basic theory related to fuzzy logic and fuzzy hybrid computing, their application in a range of practical construction problems, and emerging and future research trends.

Fuzzy logic allows computer programmers to interpret ambiguous commands that ordinary, rigid programs are unable to decipher. For instance, computers can work with words like "tall" and "expensive" rather than 6'5" or $669.95. This book covers the use of fuzzy logic in the information science and information engineering fields.

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