Insight into Fuzzy Modeling

Description: Provides a unique and methodologically consistent treatment of various areas of fuzzy modeling and includes the results of mathematical fuzzy logic and linguistics

This book is the result of almost thirty years of research on fuzzy modeling. It provides a unique view of both the theory and various types of applications. The book is divided into two parts. The first part contains an extensive presentation of the theory of fuzzy modeling. The second part presents selected applications in three important areas: control and decision-making, image processing, and time series analysis and forecasting. The authors address the consistent and appropriate treatment of the notions of fuzzy sets and fuzzy logic and their applications. They provide two complementary views of the methodology, which is based on fuzzy IF–THEN rules. The first, more traditional method involves fuzzy approximation and the theory of fuzzy relations. The second method is based on a combination of formal fuzzy logic and linguistics. A very important topic covered for the first time in book form is the fuzzy transform (F–transform). Applications of this theory are described in separate chapters and include image processing and time series analysis and forecasting. All of the mentioned components make this book of interest to students and researchers of fuzzy modeling as well as to practitioners in industry.

Features:

- Provides a foundation of fuzzy modeling and proposes a thorough description of fuzzy modeling methodology
- Emphasizes fuzzy modeling based on results in linguistics and formal logic
- Includes chapters on natural language and approximate reasoning, fuzzy control and fuzzy decision-making, and image processing using the F–transform
- Discusses fuzzy IF–THEN rules for approximating functions, fuzzy cluster analysis, and time series forecasting

Insight into Fuzzy Modeling is a reference for researchers in the fields of soft computing and fuzzy logic as well as undergraduate, master and Ph.D. students.

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