
Preface

Humans have a remarkable capability to perform a wide variety of physical and mental tasks without any measurements or computations. Computerized systems mimicking such a human capacity are often referred to as artificial intelligence and computational intelligent systems. Decision support systems with such computerized systems that make decisions based on perceptions are then called intelligent decision support systems.

This edited book is a collection of a number of representative applications of intelligent decision support systems in society and policy support, including general methodologies, case studies, on-going R&D projects, and practical applications. The volume contains 14 chapters written by 33 authors from Australia, Belgium, China, India, Italy, Japan, Spain, the UK, and the USA. These applications cover *Intelligent Decision and Policy Making Support Systems* ranging from risk modelling for policy making (“Risk Modeling for Policy Making” by Yager), consensus modelling in group decision making (“Fuzzy Logic Approaches to Consensus Modelling in Group Decision Making” by Fedrizzi and Pasi), fuzzy data envelopment analysis (“Decision Making Based on Fuzzy Data Envelopment Analysis” by Guo and Tanaka), cognitive orientation in business intelligence (“Cognitive Orientation in Business Intelligence Systems” by Niu et al.), a personalized pedestrian navigation system (“Personalized Pedestrian Navigation System with Subjective Preference Based Route Selection” by Akasaka and Onisawa), a knowledge-based recommender system (“A Knowledge Based Recommender System Based on Consistent Preference Relations” by Martínez et al.), Web resource discovery and selection (“An Intelligent Recommender System for Web Resource Discovery and Selection” by Chen and Tao), a machine learning-based intelligent decision support system (“An Intelligent Decision Support System Based on Machine Learning and Dynamic Track of Psychological Evaluation Criterion” by Feng), handling uncertain and qualitative information (“Handling Uncertain and Qualitative Information in Impact Assessment: Applications of IDS in Policy Making Support” by Xu et al.), fault diagnosis (“Fuzzy Decision Trees as Intelligent Decision Support Systems for Fault Diagnosis” by Zio et al.), safety analysis

VI Preface

(“Linguistic Assessment Approach for Hierarchical Safety Analysis and Synthesis” by Liu et al.), radioactive waste management policy decision making (“A Complex Abstraction Approach to Radioactive Waste Management Policy Decision Making” by Rao), Belgian long-term sustainable energy strategy (“Fuzzy-set Decision Support for a Belgian Long-Term Sustainable Energy Strategy” by Laes et al.), to nuclear emergency management (“On the Constructive Role of Multi-Criteria Analysis in Nuclear Emergency Management” by Turcanu et al.).

The major contributions are from the well-established international FLINS series conferences on applied computational intelligence (1994–2008). We believe intelligent decision support systems will become essential tools for future applications of risk analysis, safety, security, counter-terrorism, public option, and emergency responses in society and policy support.

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