Contents

Preface	vii
1 Introduction	1
The Logic of Decisions, Behavioral Decision Theory, and Decision Technology	1
Optimization, Outranking, Evaluation	8
Basics of Fuzzy Set Theory	10
2 Individual Decision Making in Fuzzy Environments	15
Symmetrical Models	15
Nonsymmetrical Models	23
Fuzzy Utilities	30
3 Multi-Person Decision Making in Fuzzy Environments	45
Basic Models	45
Fuzzy Games	47
Fuzzy Team Theory	53
Fuzzy Group Decision Making	58
4 Fuzzy Mathematical Programming	71
Fuzzy Linear and Nonlinear Programming	72
Fuzzy Multi-Stage Programming	109
5 Multi-Criteria Decision Making in Ill-Structured Situations	125
Fuzzy Multi-Criteria Programming	126
Multi-Attribute Decision Making (MADM)	135
Fuzzy Outranking	177
6 Operators and Membership Functions in Decision Models	193
Axiomatic, Pragmatic, and Empirical Justification	193
The Measurement of Membership Functions	197
Selecting Appropriate Operators in Decision Models	213

7 Decision Support Systems 235
Knowledge-Based vs. Data-Based Systems 235
Linguistic Variables, Fuzzy Logic, Approximate Reasoning 237
An Interactive Decision Support System for Fuzzy and Semi-fuzzy Multi-Objective Problems 248
Expert Systems and Fuzzy Sets 258