Advances in Decision Analysis

From Foundations to Applications

Edited by
Ward Edwards
Ralph F. Miles, Jr.
Detlof von Winterfeldt

Contents

List of Contributors		page ix
Pre	face	xi
1	Introduction Ward Edwards, Ralph F. Miles, Jr., and Detlof von Winterfeldt	1
PA	RT I. HISTORY AND FOUNDATIONS OF DECISION ANALYSIS	
2	The Emergence of Decision Analysis Ralph F. Miles, Jr.	13
3	The Foundations of Decision Analysis Revisited Ronald A. Howard	32
4	Decision Analysis: A Personal Account of How It Got Started and Evolved Howard Raiffa	57
5	Reflections on the Contributions of Ward Edwards to Decision Analysis and Behavioral Research Lawrence D. Phillips and Detlof von Winterfeldt	71
PA]	RT II. STRUCTURING DECISION PROBLEMS	
6	Defining a Decision Analytic Structure Detlof von Winterfeldt and Ward Edwards	81
7	Developing Objectives and Attributes Ralph L. Keeney	104
PA	RT III. PROBABILITIES AND BAYES NETS	
8	Eliciting Probabilities from Experts Stephen C. Hora	129
9	Aggregating Probability Distributions Robert T. Clemen and Robert L. Winkler	154
10	Model Building with Belief Networks and Influence Diagrams Ross D. Shachter	177
11	A Bayesian Approach to Learning Causal Networks David Heckerman	202

PĄ	RT IV. UTILITIES	
12	Utility and Risk Preferences David E. Bell	221
13	Practical Value Models Ralph L. Keeney and Detlof von Winterfeldt	232
14	Extensions of the Subjective Expected Utility Model Robert F. Nau	253
PA	RT V. RISK ANALYSIS	
15	Probabilistic Risk Analysis for Engineered Systems Vicki M. Bier and Louis Anthony Cox, Jr.	279
16	The Engineering Risk-Analysis Method and Some Applications M. Elisabeth Paté-Cornell	302
17	Health Risk Analysis for Risk-Management Decision-Making Louis Anthony Cox, Jr.	325
	RT VI. DECISION ANALISIS IN A BEHAVIORAL AND GANIZATIONAL CONTEXT	
18	What Have We Learned from Our Mistakes? Barbara Mellers and Connson Locke	351
19	Decision Conferencing Lawrence D. Phillips	375
20	Resource Allocation Decisions Don N. Kleinmuntz	400
21	From Decision Analysis to the Decision Organization David Matheson and James E. Matheson	419
22	Building Decision Competency in Organizations Carl S. Spetzler	451
23	Negotiation Analysis: Retween Decisions and Games James K. Sebenius	469
PA	RT VII. APPLICATIONS OF DECISION ANALYSIS	
24	The Adoption of Multiattribute Utility Theory for the Evaluation of Plutonium Disposition Options in the United States and Russia John C. Butler, Alexander N. Chebeskov, James S. Dyer, Thomas A. Edmunds, Jianmin Jia, and Vladimir I. Oussanov	489
25	Choosing a Tritium Supply Technology for Nuclear Weapons: Reflections on a Controversial Decision Analysis Detlof von Winterfeldt	514
26	Applications of Decision Analysis to the Military Systems Acquisition Process Dennis M. Buede and Terry A. Bresnick	539

Contents

27	Balancing Environmental and Operational Objectives in Nuclear Refueling Strategies Phillip C. Beccue and Jeffrey S. Stonebraker	564
28	Perspective on Decision Analysis Applications Donald L. Keefer, Craig W. Kirkwood, and James L. Corner	582
Ind	lex	611