Contents

Notes on Contributors xi
Acknowledgments xix

INTRODUCTION

Making Sense of the Process of Proof in Litigation
Peter Tillers 3

PART ONE: COMMON SENSE REASONING

Artificial Intelligence, Mindreading, and Reasoning in Law
Jolyi A, Barnden and Donald M. Peterson 21

Common Sense, Rationality and the Legal Process
Ronald J. Allen 43

What Is "Common" about Common Sense? Cautionary Tales for
Travelers Crossing Disciplinary Boundaries
Marilyn MacCrimmon 55

PART TWO: FUZZY AND ROUGH LOGIC

From Computing with Numbers to Computing with Words:
From Manipulation of Measurements to Manipulation of Perceptions
LotfiA. Zadeh 81

Fuzzy Logic and Its Application to Legal Reasoning —
A Comment to Professor Zadeh
Ron A. Shapira 119

A Primer on Rough Sets: A New Approach to Drawing
Conclusions from Data
Zdzislaw Pawlak 135

PART THREE: THE STRUCTURE OF FACTUAL INFERENCE IN JUDICIAL SETTINGS

Alternative Views of Argument Construction from a Mass of Evidence
David A. Schum 145

Explaining Relevance
Paolo Garbolino 179
Theories of Uncertainty: Explaining the Possible Sources of Error in Inferences 197
  Vent R. Walker

Models of Data Generation vs. Models of Events that Generate Data 237
  Ward Edwards

PART FOUR: DYNAMIC INFERENCE AND CHOICE IN DYNAMIC ENVIRONMENTS

Action and Procedure in Reasoning 243
  Johan van Benthem

Decision Analysis and Law 261
  Ronald A. Howard

PART FIVE: ABDUCTIVE INFERENCE

Serendipity and Abduction in Proofs, Presumptions and Emerging Laws 273
  Pek van An德尔 and Danielle Bourcier

On the Proof Dynamics of Inference to the Best Explanation 287
  John R. Josephson

Species of Abductive Reasoning in Fact Investigation in Law 307
  David A. Schum

Abductive Reasoning in Law: Taxonomy and Inference to the Best Explanation 337
  Kola Abimbola

PART SIX: FROM THEORY TO PRACTICE: "INTELLIGENT" PROCEDURES FOR DRAWING INFERENCES IN STATIC AND DYNAMIC LEGAL ENVIRONMENTS

Computational Inference for Evidential Reasoning in Support of Judicial Proof 345
  Tod S. Levitt and Kathryn Blackmond Laskey

Logical Argumentation, Abduction and Bayesian Decision Theory: A Bayesian Approach to Logical Arguments and Its Application to Legal Evidential Reasoning 385
  David Poole

Structured Deliberation for Dynamic Uncertain Inference 397
  Paul Snow and Marianne Belis

PART SEVEN: JUDICIAL PROOF AND ECONOMIC RATIONALLY

Saving Desdemona 419
  Ron A. Shapira
Othello Could Not Optimize: Economics, Hearsay, and Less Adversary Systems
Craig R. Callen

PART EIGHT: CAUSALITY

Causality and Responsibility
Glenn Shafer

Liability for Increased Risk of Harm: A Lawyer's Response to Professor Shafer
Melanie B. Leslie