

# Contents

Series Foreword ix

Preface xi

## **Introduction 1**

- 1 "Modeling" and "Bounded Rationality" 1
- 2 The Aim of This Book 2
- 3 The State of the Art 3
- 4 A Personal Note 5
- 5 Bibliographic Notes 5

## **1 Bounded Rationality in Choice 7**

- 1.1 The "Rational Man" 7
- 1.2 The Traditional Economist's Position 10
- 1.3 The Attack on the Traditional Approach 13
- 1.4 Experimental Evidence 16
- 1.5 Comments 21
- 1.6 Bibliographic Notes 23
- 1.7 Projects 24

## **2 Modeling Procedural Decision Making 25**

- 2.1 Motivation 25
- 2.2 Preparing the Tools: Similarity Relations 28
- 2.3 A Procedure of Choice Between Vectors 29
- 2.4 Analysis 31
- 2.5 Case-Based Theory 34
- 2.6 Bibliographic Notes 37
- 2.7 Projects 37

- 3 Modeling Knowledge 41**
  - 3.1 Knowledge and Bounded Rationality 41
  - 3.2 Information Structure 41
  - 3.3 The Set-Theoretical Definition of Knowledge 46
  - 3.4 Kripke's Model 48
  - 3.5 The Impact of the Timing of Decisions and Having More Information 52
  - 3.6 On the Possibility of Speculative Trade 56
  - 3.7 Bibliographic Notes 60
  - 3.8 Projects 61
  
- 4 Modeling Limited Memory 63**
  - 4.1 Imperfect Recall 63
  - 4.2 An Extensive Decision Making Model with Imperfect Information 64
  - 4.3 Perfect and Imperfect Recall 68
  - 4.4 Time Consistency 70
  - 4.5 The Role of Randomization 75
  - 4.6 The Multiselves Approach 78
  - 4.7 On the Problematics of Using the Model 81
  - 4.8 Bibliographic Notes 84
  - 4.9 Projects 84
  
- 5 Choosing What to Know 87**
  - 5.1 Optimal Information Structures 87
  - 5.2 What Is "High" and What Is "Low"? 89
  - 5.3 Manipulating Informational Restrictions 93
  - 5.4 Perceptrons 100
  - 5.5 Bibliographic Notes 104
  - 5.6 Projects 104
  
- 6 Modeling Complexity in Group Decisions 107**
  - 6.1 Introduction 107
  - 6.2 The Model of a Team 108
  - 6.3 Processing Information 113
  - 6.4 Aggregating Preferences 117
  - 6.5 Bibliographic Notes 119
  - 6.6 Projects 120

- 7 Modeling Bounded Rationality in Games 121**
  - 7.1 Introduction 121
  - 7.2 Interaction Between Luce Players 122
  - 7.3 A Game with Procedural Rational Players 124
  - 7.4 Limited Foresight in Extensive Games 129
  - 7.5 Bibliographic Notes 135
  - 7.6 Projects 135
  
- 8 Complexity Considerations in Repeated Games 137**
  - 8.1 Introduction 137
  - 8.2 The Model of Repeated Games: A Brief Review 138
  - 8.3 Strategies as Machines in Infinitely Repeated Games 143
  - 8.4 Complexity Considerations in Repeated Games 149
  - 8.5 The Structure of Machine Game Equilibria 152
  - 8.6 Repeated Extensive Games 159
  - 8.7 Concluding Remarks 161
  - 8.8 Bibliographic Notes 163
  - 8.9 Projects 163
  
- 9 Attempts to Resolve the Finite Horizon Paradoxes 165**
  - 9.1 Motivation 165
  - 9.2 Implementation of Strategies by Machines 166
  - 9.3 Counting Is Costly 168
  - 9.4 Bounded Capability to Count 169
  - 9.5 Machines Also Send Messages 170
  - 9.6 The  $\epsilon$ -Equilibrium Approach: A Deviation Is Costly 172
  - 9.7 Conclusion 173
  - 9.8 Bibliographic Notes 174
  - 9.9 Projects 174
  
- 10 Computability Constraints in Games 175**
  - 10.1 Introduction 175
  - 10.2 Informal Results on Computability 178
  - 10.3 Is There a Rational Player? 181
  - 10.4 Turing Machine Game 184
  - 10.5 Bibliographic Notes 185
  - 10.6 Projects 185

<b>11 Final Thoughts</b>	<b>187</b>
11.1 Simon's Critique	187
11.2 Response	190
References	195
Index	203