

# Contents

Preface.....	xi
<b>CHAPTER 1</b>	
<b>Introduction</b>	
<b>CHAPTER 2</b>	
<b>Markovian Decision Processes with Discounting</b>	
2.1 Introduction.....	4
2.2 Policy Iteration Algorithm.....	5
2.3 Linear Programming Algorithm.....	8
2.4 Relationship between the Two Algorithms.....	12
2.5 Return Structures.....	17
2.6 Examples.....	17
2.7 Sensitivity Analysis with Respect to a Discount Factor.....	20
References and Comments.....	23
<b>CHAPTER 3</b>	
<b>Markovian Decision Processes with No Discounting I</b>	
3.1 Introduction.....	24
3.2 Preliminaries.....	24
3.3 Policy Iteration Algorithm.....	28
3.4 Linear Programming Algorithm.....	31
3.5 Relationship between the Two Algorithms.....	33
3.6 Examples.....	36
3.7 Terminating Process.....	42
References and Comments.....	44
<b>CHAPTER 4</b>	
<b>Markovian Decision Processes with No Discounting II</b>	
4.1 Introduction.....	45
4.2 Policy Iteration Algorithm.....	46
4.3 Policy Iteration Algorithm for Finding 1-Optimal Strategies.....	53
4.4 Linear Programming Algorithm.....	57
References and Comments.....	63
<b>CHAPTER 5</b>	
<b>Dynamic Programming Viewpoint of Markovian Decision Processes</b>	
5.1 Introduction.....	64
5.2 Dynamic Programming.....	64
5.3 Properties of an Optimal Policy.....	67
References and Comments.....	74

## **CHAPTER 6**

### **Semi-Markovian Decision Processes**

6.1 Introduction.....	75
6.2 Semi-Markov Processes.....	76
6.3 Semi-Markov Processes with Returns.....	79
6.4 Semi-Markovian Decision Processes with Discounting.....	84
6.5 Semi-Markovian Decision Processes with No Discounting.....	90
References and Comments.....	98

## **CHAPTER 7**

### **Generalized Markovian Decision Processes**

7.1 Introduction.....	99
7.2 Definitions and Notation.....	99
7.3 Existence Theorems.....	102
7.4 Special Cases.....	108
References and Comments.....	110

## **CHAPTER 8**

### **The Principle of Contraction Mappings in Markovian Decision Processes**

8.1 Introduction.....	111
8.2 Contraction and Monotonicity Assumptions.....	112
8.3 Optimization Schemes.....	118
8.4 Symmetries.....	119
8.5 Examples.....	120
References and Comments.....	123

## **CHAPTER 9**

### **Conclusion**

9.1 History.....	124
9.2 Applications.....	125

## **APPENDIX**

<b>Stochastic Games</b> .....	127
<b>Bibliography</b> .....	132
<b>Author Index</b> .....	139
<b>Subject Index</b> .....	141