Contents

1 Preliminaries
1.1 Introduction and summary 1
1.2 The stochastic game model 6
1.3 Strategies 7
1.4 Evaluation criteria 8
1.5 Rewards for stationary strategies 11
1.6 Playing against a fixed stationary strategy 15
1.7 Zero-sum stochastic games 17
1.8 General-sum stochastic games 22

2 Particular initial states in stochastic games
2.1 Introduction 27
2.2 Limit properties for sequences of strategy pairs 28
2.3 Strong initial states in the general-sum case 30
2.4 (ε-) Easy initial states in the zero-sum case 37

3 Existence of limiting average equilibria
3.1 Introduction 47
3.2 Finding more strong initial states 47

4 Special classes of stochastic games
4.1 Introduction 61
4.2 Unichain stochastic games 61
4.3 Stochastic games with state independent transitions 62
4.4 Repeated games with absorbing states 64

5 The total reward criterion in zero-sum stochastic games
5.1 Introduction 71
5.2 The total reward criterion 71
5.3 Stochastic games and optimal stationary strategies 78
5.4 The bad match 81
5.5 Conclusions 87

6 Stochastic games and mathematical programming
6.1 Introduction 89
6.2 Programs for the β-discounted reward criterion 90
6.3 Programs for the limiting average reward criterion 92
6.4 Programs for the total reward criterion 97

References 101
Author index 105
Subject index 107