

Dynamic Programming and Optimal Control

Volume II

SECOND EDITION

Dimitri P. Bertsekas

Massachusetts Institute of Technology

Technische Universität Darmstadt
FACHBEREICH INFORMATIK

B I B L I O T H E K

Inventar-Nr.: 1104-00197

Sachgebiete: _____

Standort: _____

WWW site for book information and orders

<http://www.athenasc.com>



Athena Scientific, Belmont, Massachusetts

Contents

1. Infinite Horizon – Discounted Problems

1.1. Minimization of Total Cost – Introduction	p. 2
1.2. Discounted Problems with Bounded Cost per Stage	p. 9
1.3. Finite-State Systems – Computational Methods	p. 16
1.3.1. Value Iteration and Error Bounds	p. 19
1.3.2. Policy Iteration	p. 35
1.3.3. Adaptive Aggregation	p. 46
1.3.4. Linear Programming	p. 53
1.3.5. Limited Lookahead Policies	p. 55
1.4. The Role of Contraction Mappings	p. 58
1.5. Scheduling and Multiarmed Bandit Problems	p. 60
1.6. Notes, Sources, and Exercises	p. 72

2. Stochastic Shortest Path Problems

2.1. Main Results	p. 86
2.2. Computational Methods	p. 95
2.2.1. Value Iteration	p. 96
2.2.2. Policy Iteration	p. 99
2.3. Simulation-Based Methods	p. 102
2.3.1. Policy Evaluation by Monte-Carlo Simulation	p. 103
2.3.2. Q -Learning	p. 107
2.3.3. Approximations	p. 109
2.3.4. Extensions to Discounted Problems	p. 126
2.3.5. The Role of Parallel Computation	p. 128
2.4. Notes, Sources, and Exercises	p. 129

3. Undiscounted Problems

3.1. Unbounded Costs per Stage	p. 142
3.2. Linear Systems and Quadratic Cost	p. 158
3.3. Inventory Control	p. 160
3.4. Optimal Stopping	p. 163

3.5. Optimal Gambling Strategies	p. 168
3.6. Nonstationary and Periodic Problems	p. 175
3.7. Notes, Sources, and Exercises	p. 180
4. Average Cost per Stage Problems	
4.1. Preliminary Analysis	p. 192
4.2. Optimality Conditions	p. 199
4.3. Computational Methods	p. 210
4.3.1. Value Iteration	p. 210
4.3.2. Policy Iteration	p. 226
4.3.3. Linear Programming	p. 234
4.3.4. Simulation-Based Methods	p. 235
4.4. Infinite State Space	p. 240
4.5. Notes, Sources, and Exercises	p. 244
5. Continuous-Time Problems	
5.1. Uniformization	p. 254
5.2. Queueing Applications	p. 261
5.3. Semi-Markov Problems	p. 272
5.4. Notes, Sources, and Exercises	p. 282
References	p. 285
Index	p. 301