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Chapter 2 Exercises3 Computer Simulation of Natural Evolution; 3.1 Early Speculations and Specific Attempts; 3.1.1 Evolutionary Operation; 3.1.2 A Learning Machine; 3.2 Artificial Life; 3.3 Evolutionary Programming; 3.4 Evolution Strategies; 3.5 Genetic Algorithms; 3.6 The Evolution of Evolutionary Computation; References; Chapter 3 Exercises; 4 Theoretical and Empirical Properties of Evolutionary Computation; 4.1 The Challenge; 4.2 Theoretical Analysis of Evolutionary Computation; 4.2.1 The Framework for Analysis; 4.2.2 Convergence in the Limit
4.2.3 The Error of Minimizing Expected Losses in Schema Processing4.2.3.1 The Two-Armed Bandit Problem; 4.2.3.2 Extending the Analysis for "Optimally" Allocating Trials; 4.2.3.3 Limitations of the Analysis; 4.2.4 Misallocating Trials and the Schema Theorem in the Presence of Noise; 4.2.5 Analyzing Selection; 4.2.6 Convergence Rates for Evolutionary Algorithms; 4.2.7 Does a Best Evolutionary Algorithm Exist?; 4.3 Empirical Analysis; 4.3.1 Variations of Crossover; 4.3.2 Dynamic Parameter Encoding; 4.3.3 Comparing Crossover to Mutation; 4.3.4 Crossover as a Macromutation
4.3.5 Self-Adaptation in Evolutionary Algorithms4.3.6 Fitness Distributions of Search Operators; 4.4 Discussion; References; Chapter 4 Exercises; 5 Intelligent Behavior; 5.1 Intelligence in Static and Dynamic Environments; 5.2 General Problem Solving: Experiments with Tic-Tac-Toe; 5.3 The Prisoner's Dilemma: Coevolutionary Adaptation; 5.3.1 Background; 5.3.2 Evolving Finite-State Representations; 5.4 Learning How to Play Checkers without Relying on Expert Knowledge; 5.5 Evolving a Self-Learning Chess Player; 5.6 Discussion; References; Chapter 5 Exercises; 6 Perspective
6.1 Evolution as a Unifying Principle of Intelligence

Sommario/riassunto

This Third Edition provides the latest tools and techniques that enable computers to learnThe Third Edition of this internationally acclaimed publication provides the latest theory and techniques for using simulated evolution to achieve machine intelligence. As a leading advocate for evolutionary computation, the author has successfully challenged the traditional notion of artificial intelligence, which essentially programs human knowledge fact by fact, but does not have the capacity to learn or adapt as evolutionary computation does. Readers gain an understanding of the history