

1. Record Nr.	UNINA9910488695403321
Titolo	Advances in learning automata and intelligent optimization / / Javidan Kazemi Kordestani [and three others], editors
Pubbl/distr/stampa	Cham, Switzerland : , : Springer, , [2021] ©2021
ISBN	3-030-76291-2
Descrizione fisica	1 online resource (355 pages)
Collana	Intelligent Systems Reference Library ; ; 208
Disciplina	006.31
Soggetti	Aprenentatge automàtic Optimització matemàtica Mathematical optimization Llibres electrònics
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di bibliografia	Includes bibliographical references.
Nota di contenuto	Intro -- Preface -- Contents -- About the Authors -- Abbreviations -- 1 An Introduction to Learning Automata and Optimization -- 1.1 Introduction -- 1.2 Learning Automata -- 1.2.1 Learning Automata Variants -- 1.2.2 Recent Applications of Learning Automata -- 1.3 Optimization -- 1.3.1 Evolutionary Algorithms and Swarm Intelligence -- 1.4 Reinforcement Learning and Optimization Methods -- 1.4.1 Static Optimization -- 1.4.2 Dynamic Optimization -- 1.5 LA and Optimization Timeline -- 1.6 Chapter Map -- 1.7 Conclusion -- References -- 2 Learning Automaton and Its Variants for Optimization: A Bibliometric Analysis -- 2.1 Introduction -- 2.2 Learning Automata Models and Optimization -- 2.3 Material and Method -- 2.3.1 Data Collection and Initial Results -- 2.3.2 Refining the Initial Results -- 2.4 Analyzing the Results -- 2.4.1 Initial Result Statistics -- 2.4.2 Top Journals -- 2.4.3 Top Researchers -- 2.4.4 Top Papers -- 2.4.5 Top Affiliations -- 2.4.6 Top Keywords -- 2.5 Conclusion -- References -- 3 Cellular Automata, Learning Automata, and Cellular Learning Automata for Optimization -- 3.1 Introduction -- 3.2 Preliminaries -- 3.2.1 Cellular Automata -- 3.2.2 Learning Automata -- 3.2.3 Cellular Learning Automata -- 3.3 CA, CLA, and LA Models for Optimization --

3.3.1 Cellular Learning Automata-Based Evolutionary Computing (CLA-EC) -- 3.3.2 Cooperative Cellular Learning Automata-Based Evolutionary Computing (CLA-EC) -- 3.3.3 Recombinative Cellular Learning Automata-Based Evolutionary Computing (RCLA-EC) -- 3.3.4 CLA-EC with Extremal Optimization (CLA-EC-EO) -- 3.3.5 Cellular Learning Automata-Based Differential Evolution (CLA-DE) -- 3.3.6 Cellular Particle Swarm Optimization (Cellular PSO) -- 3.3.7 Firefly Algorithm Based on Cellular Learning Automata (CLA-FA) -- 3.3.8 Harmony Search Algorithm Based on Learning Automata (LAHS).
3.3.9 Learning Automata Based Butterfly Optimization Algorithm (LABOA) -- 3.3.10 Grey Wolf Optimizer Based on Learning Automata (GWO-LA) -- 3.3.11 Learning Automata Models with Multiple Reinforcements (MLA) -- 3.3.12 Cellular Learning Automata Models with Multiple Reinforcements (MCLA) -- 3.3.13 Multi-reinforcement CLA with the Maximum Expected Rewards (MCLA) -- 3.3.14 Gravitational Search Algorithm Based on Learning Automata (GSA-LA)
-- 3.4 Conclusion -- References -- 4 Learning Automata for Behavior Control in Evolutionary Computation -- 4.1 Introduction -- 4.2 Types of Parameter Adjustment in EC Community -- 4.2.1 EC with Constant Parameters -- 4.2.2 EC with Time-Varying Parameters -- 4.3 Differential Evolution -- 4.3.1 Initialization -- 4.3.2 Difference-Vector Based Mutation -- 4.3.3 Repair Operator -- 4.3.4 Crossover -- 4.3.5 Selection -- 4.4 Learning Automata for Adaptive Control of Behavior in Differential Evolution -- 4.4.1 Behavior Control in DE with Variable-Structure Learning Automaton -- 4.4.2 Behavior Control in DE with Fixed-Structure Learning Automaton -- 4.5 Experimental Setup -- 4.5.1 Benchmark Functions -- 4.5.2 Algorithm's Configuration -- 4.5.3 Simulation Settings and Results -- 4.5.4 Experimental Results -- 4.6 Conclusion -- References -- 5 A Memetic Model Based on Fixed Structure Learning Automata for Solving NP-Hard Problems -- 5.1 Introduction -- 5.2 Fixed Structure Learning Automata and Object Migrating Automata -- 5.2.1 Fixed Structure Learning Automata -- 5.2.2 Object Migration Automata -- 5.3 GALA -- 5.3.1 Global Search in GALA -- 5.3.2 Crossover Operator -- 5.3.3 Mutation Operator -- 5.3.4 Local Learning in GALA -- 5.3.5 Applications of GALA -- 5.4 The New Memetic Model Based on Fixed Structure Learning Automata -- 5.4.1 Hybrid Fitness Function -- 5.4.2 Mutation Operators -- 5.4.3 Crossover Operators.
5.5 The OneMax Problem -- 5.5.1 Local Search for OneMax -- 5.5.2 Experimental Results -- 5.6 Conclusion -- References -- 6 The Applications of Object Migration Automaton (OMA)-Memetic Algorithm for Solving NP-Hard Problems -- 6.1 Introduction -- 6.2 The Equipartitioning Problem -- 6.2.1 Local Search for EPP -- 6.2.2 Experimental Results -- 6.3 The Graph Isomorphism Problem -- 6.3.1 The Local Search in the Graph Isomorphism Problem -- 6.3.2 Experimental Results -- 6.4 Assignment of Cells to Switches Problem (ACTSP) in Cellular Mobile Network -- 6.4.1 Background and Related Work -- 6.4.2 The OMA-MA for Assignment of Cells to Switches Problem -- 6.4.3 The Framework of the OMA-MA Algorithm -- 6.4.4 Experimental Result -- 6.5 Conclusion -- References -- 7 An Overview of Multi-population Methods for Dynamic Environments -- 7.1 Introduction -- 7.2 Moving Peaks Benchmark -- 7.2.1 Extended Versions of MPB -- 7.3 Performance Measurement -- 7.4 Types of Multi-population Methods -- 7.4.1 Methods with a Fixed Number of Populations -- 7.4.2 Methods with a Variable Number of Populations -- 7.4.3 Methods Based on Population Clustering -- 7.4.4 Self-adapting the Number of Populations -- 7.5 Numerical Results -- 7.6 Conclusions -- References -- 8 Learning Automata for Online Function

Evaluation Management in Evolutionary Multi-population Methods for Dynamic Optimization Problems -- 8.1 Introduction -- 8.2 Preliminaries -- 8.2.1 Waste of FEs Due to Change Detection -- 8.2.2 Waste of FEs Due to the Excessive Number of Sub-populations -- 8.2.3 Waste of FEs Due to Overcrowding of Subpopulations in the Same Area of the Search Space -- 8.2.4 Waste of FEs Due to Exclusion Operator -- 8.2.5 Allocation of FEs to Unproductive Populations -- 8.2.6 Unsuitable Parameter Configuration of the EC Methods -- 8.2.7 Equal Distribution of FEs Among Sub-populations.

8.3 Theory of Learning Automata -- 8.3.1 Fixed Structure Learning Automata -- 8.3.2 Variable Structure Learning Automata -- 8.4 EC Techniques under Study -- 8.4.1 Particle Swarm Optimization -- 8.4.2 Firefly Algorithm -- 8.4.3 Jaya -- 8.5 LA-Based FE Management Model for MP Evolutionary Dynamic Optimization -- 8.5.1 Initialization of Sub-populations -- 8.5.2 Detection and Response to Environmental Changes -- 8.5.3 Choose a Sub-population for Execution -- 8.5.4 Evaluate the Search Progress of Populations and Generate the Reinforcement Signal -- 8.5.5 Exclusion -- 8.6 FE-Management in MP Method with a Fixed Number of Populations -- 8.6.1 VSLA-Based FE Management Strategy -- 8.6.2 FSLA-Based FE Management Strategies -- 8.7 Experimental Study -- 8.7.1 Experimental Setup -- 8.7.2 Experimental Results and Discussion -- 8.8 Conclusion -- References -- 9 Function Management in Multi-population Methods with a Variable Number of Populations: A Variable Action Learning Automaton Approach -- 9.1 Introduction -- 9.2 Main Framework of Clustering Particle Swarm Optimization -- 9.2.1 Creating Multiple Sub-swarms from the Cradle Swarm -- 9.2.2 Local Search by PSO -- 9.2.3 Status of Sub-swarms -- 9.2.4 Detection and Response to Environmental Changes -- 9.3 Variable Action-Set Learning Automata -- 9.4 FEM in MP Methods with a Variable Number of Populations -- 9.5 Experimental Study -- 9.5.1 Dynamic Test Function -- 9.5.2 Performance Measure -- 9.5.3 Experimental Settings -- 9.5.4 Experimental Results -- 9.6 Conclusions -- References.
