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Autore	Liu Jiming <1962->
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Nota di contenuto	Preface; Acknowledgements; Contents; Chapter 1 Introduction; 1.1 What is an Agent?; 1.2 Basic Questions and Fundamental Issues; 1.3 Learning; 1.3.1 Learning in Natural and Artificial Systems; 1.3.2 Agent Learning Techniques; 1.4 Neural Agents; 1.4.1 Self-Organizing Maps (SOM); 1.4.2 SOM Applications; 1.5 Evolutionary Agents; 1.6 Learning in Cooperative Agents; 1.7 Computational Architectures; 1.7.1 Subsumption Architecture; 1.7.2 Action Selection; 1.7.3 Motif Architecture; 1.8 Agent Behavioral Learning; 1.8.1 What is the Behavior of a Learning Agent?; 1.8.2 What is Behavioral Learning? Chapter 2 Behavioral Modeling, Planning, and Learning 2.1 Manipulation Behaviors; 2.2 Modeling and Planning Manipulation Behaviors; 2.2.1 State-Oriented Representation; 2.2.2 State-Transition Function (); 2.2.3 Behavioral Planning Based on Action Schemata; 2.3 Manipulation Behavioral Learning; 2.3.1 Automatic Induction of State Transitions; 2.3.2 Empirical Sample Generation; 2.4 Summary; 2.5 Other Modeling, Planning, and Learning Methods; 2.5.1 Artificial Potential Fields (APF); 2.5.2 Artificial Neural Networks (ANN); 2.5.3 Similarities and Differences between APF and ANN; 2.5.4 APF Meets ANN

2.5.5 Summary
2.6 Bibliographical and Historical Remarks; 2.6.1 Assembly Operation Planning; 2.6.2 AI Planning; 2.6.3 Manipulation Behavioral Planning; Chapter 3 Synthetic Autonomy; 3.1 Synthetic Autonomy Based on Behavioral Self-Organization; 3.2 Behavioral Self-Organization; 3.2.1 Overview; 3.2.2 The Athlete Agent; 3.3 Summary; 3.4 Bibliographical and Historical Remarks; 3.4.1 Animation of Articulated Figures; 3.4.2 Lifelike Behavior; 3.4.3 Emergent Behavior; Chapter 4 Dynamics of Distributed Computation; 4.1 Definitions; 4.2 Overview of the Approach; 4.2.1 Local Stimuli to Agents 4.2.2 Reactive Behavior of Distributed Agents 4.3 Dynamics of Agent-Based Distributed Search; 4.3.1 Dynamic Systems Models; 4.3.2 Agents with Different Dynamic Behaviors; 4.3.3 Summary of Agent-Based Distributed Computation; 4.4 Remarks; 4.4.1 Dynamic Systems Modeling; 4.4.2 Agent Semi-Autonomy; 4.4.3 Characteristics of the Agent-Based Approach; 4.4.4 The Goal-Attainability of Agents; 4.5 Summary; 4.5.1 Open Problems; 4.5.2 Extensions; 4.6 Bibliographical and Historical Remarks; Chapter 5 Self-Organized Autonomy in Multi-Agent Systems; 5.1 Collective Vision and Motion 5.2 Self-Organized Vision for Image Feature Detection and Tracking 5.2.1 Overview of Self-Organized Vision; 5.2.2 A Two-Dimensional Lattice Environment; 5.2.3 Local Stimuli in a Two-Dimensional Lattice; 5.2.4 Self-Organizing Behaviors; 5.2.5 The Reproduce-and-Diffuse (R-D) Algorithm; 5.2.6 Examples; 5.3 Self-Organized Motion in Group Robots; 5.3.1 The Task of Group Navigation and Homing; 5.3.2 Overview of the Multi-Agent System; 5.3.3 Local Memory-Based Behavioral Selection and Global Performance-Based Behavioral Learning; 5.3.4 Dynamics of Different Agent Groups; 5.3.5 Examples; 5.3.6 Remarks 5.4 Summary

Sommario/riassunto

An autonomous agent is a computational system that acquires sensory data from its environment and decides by itself how to relate the external stimulus to its behaviors in order to attain certain goals. Responding to different stimuli received from its task environment, the agent may select and exhibit different behavioral patterns. The behavioral patterns may be carefully predefined or dynamically acquired by the agent based on some learning and adaptation mechanism(s). In order to achieve structural flexibility, reliability through redundancy, adaptability, and reconfigurability in real-world
