



# Advanced Artificial Intelligence

WSPC,  
2011

Electronic resource

Monografía

Artificial intelligence is a branch of computer science and a discipline in the study of machine intelligence, that is, developing intelligent machines or intelligent systems imitating, extending and augmenting human intelligence through artificial means and techniques to realize intelligent behavior. Advanced Artificial Intelligence consists of 16 chapters. The content of the book is novel, reflects the research updates in this field, and especially summarizes the author's scientific efforts over many years. The book discusses the methods and key technology from theory, algorithm, system and

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**Título:** Advanced Artificial Intelligence

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**Descripción física:** 1 online resource

**Contenido:** Preface; Acknowledgement; Contents; Chapter 1 Introduction; 1.1 Brief History of AI; 1.2 Cognitive Issues of AI; 1.3 Hierarchical Model of Thought; 1.4 Symbolic Intelligence; 1.5 Research Approaches of Artificial Intelligence; 1.5.1 Cognitive School; 1.5.2 Logical School; 1.5.3 Behavioral School; 1.6 Automated Reasoning; 1.7 Machine Learning; 1.8 Distributed Artificial Intelligence; 1.9 Artificial Thought Model; 1.10 Knowledge Based Systems; Exercises; Chapter 2 Logic Foundation of Artificial Intelligence; 2.1 Introduction; 2.2 Logic Programming; 2.2.1 Definitions of logic programming 2.11.2 Criteria for a solution to the frame problem 2.11.3 Nonmonotonic solving approach of the frame problem; 2.12 Dynamic Description Logic; 2.12.1 Description Logic; 2.12.2 Syntax of dynamic description logic; 2.12.3 Semantics of dynamic description logic; Exercises; Chapter 3 Constraint Reasoning; 3.1 Introduction; 3.2 Backtracking; 3.3 Constraint Propagation; 3.4 Constraint Propagation in Tree Search; 3.5 Intelligent Backtracking and Truth Maintenance; 3.6 Variable Instantiation Ordering and Assignment Ordering; 3.7 Local Revision Search; 3.8 Graph-based Backjumping 3.9 Influence-based Backjumping 3.10 Constraint Relation Processing; 3.10.1 Unit Sharing Strategy for Identical Relation; 3.10.2 Interval Propagation; 3.10.3 Inequality Graph; 3.10.4 Inequality Reasoning; 3.11 Constraint Reasoning System COPS; 3.12 ILOG Solver; Exercise; Chapter 4 Qualitative Reasoning; 4.1 Introduction; 4.2 Basic approaches in qualitative reasoning; 4.3 Qualitative Model; 4.4 Qualitative Process; 4.5 Qualitative Simulation Reasoning; 4.5.1 Qualitative state transformation; 4.5.2 QSIM algorithm; 4.6 Algebra Approach; 4.7 Spatial Geometric Qualitative Reasoning 4.7.1 Spatial logic 4.7.2 Temporal spatial relation; 4.7.3. Applications of temporal and spatial logic; 4.7.4. Randell algorithm; Exercises; Chapter 5 Case-Based Reasoning; 5.1 Overview; 5.2 Basic Notations; 5.3 Process Model; 5.4 Case Representation; 5.4.1 Semantic Memory Unit; 5.4.2 Memory Network; 5.5 Case Indexing;

5.6 Case Retrieval; 5.7 Similarity Relations in CBR; 5.7.1 Semantic similarity; 5.7.2 Structural similarity; 5.7.3 Goal's features; 5.7.4 Individual similarity; 5.7.5 Similarity assessment; 5.8 Case Reuse; 5.9 Case Retainion; 5.10 Instance-Based Learning

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