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Artificial Intelligence

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Product Description

Artificial Intelligence serves as a comprehensive and structured guide to the fundamental principles, techniques, and transformative real-world applications of AI. Recognizing AI as one of the 21st century's most essential technologies, this book is an invaluable resource for mastering the concepts required to understand and develop intelligent systems. It is meticulously designed to guide readers from foundational concepts, such as the history of AI and the nature of intelligent agents, through increasingly sophisticated methodologies.

The core themes delve into problem-solving paradigms, including uninformed and informed search strategies like A* search, Hill Climbing, and Genetic Algorithms, alongside the critical aspects of optimal decision-making in competitive environments using techniques like Alpha-Beta Pruning. A significant portion is dedicated to Knowledge Representation and Reasoning, exploring formal logic (Propositional and First-Order), Ontological Engineering, and the mechanisms of logical inference like Forward and Backward Chaining. Furthermore, the text addresses acting logically in uncertain, real-world settings by utilizing Bayesian networks and decision theory to ensure rational planning.

By integrating theoretical foundations with practical implementation examples, this book is an essential resource for students, educators, researchers, and professionals seeking to bridge the gap between academic knowledge and the creation of intelligent systems capable of solving complex, real-world challenges.

Salient Features

• Search & Problem Solving: Details a full spectrum of search algorithms, including uninformed (BFS, DFS) and advanced heuristic strategies like A* search, Hill Climbing, and Simulated Annealing.

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• Game Theory Insights: Covers optimal decision-making strategies in adversarial environments, featuring comprehensive coverage of Minimax search and efficiency enhancement via Alpha-Beta Pruning.

• Logical Reasoning: Presents a deep dive into Knowledge Representation using First-Order Logic, Situation Calculus, and practical inference mechanisms like Forward and Backward Chaining.

• Uncertainty Handling: Explains Probabilistic Reasoning and Decision-Making in non-deterministic environments, focusing on the application of Bayes's rules and the semantics of Belief Networks.

• Planning Methodologies: Explores agent planning techniques from state-space search to Partial Order Planning (POP), offering methods for both theoretical plan representation and real-world action execution.

• Practical Learning:Promotes a holistic learning experience by blending theoretical depth with practical implementation through problem-solving exercises and complex real-world examples in each unit.

• AI Applications: Dedicates an entire unit to transformative applications like Natural Language Processing (NLP), Machine Translation, Information Retrieval, and core Robotics concepts.

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