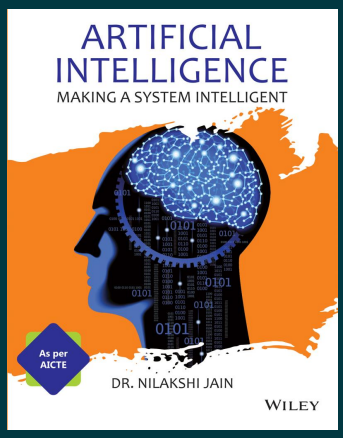

Artificial Intelligence, As per AICTE: Making a System Intelligent

By Dr. Nilakshi Jain

Paperback 9788126579945 ₹799.00

Pages: 444

Description

Artificial Intelligence: Making a System Intelligent explains concept of intelligent systems, techniques from knowledge-based systems, neural networks, fuzzy systems, evolutionary computation, and intelligent agents. The principles behind these techniques have been explained in this book without resorting to complex mathematics. The lack of assumed prior knowledge makes this book ideal for any introductory course in artificial intelligence or intelligent systems design. The contemporary coverage of this book is highly beneficial to advanced students as it facilitates in discovering state-of-the-art techniques, particularly in intelligent agents and knowledge discovery.

Appendix A

Appendix B

About the Author

Dr. Nilakshi Jain

Dr. Nilakshi Jain currently serves as an Associate Professor at the Shah & Anchor Kutchhi Engineering College in the Information Technology Department, Mumbai, India. She is the Research Coordinator of SAKEC Research Cell and President of Institution Innovation Council. She is a Certified Ethical Hacker CEH (EC-Council- USA). She has a rich experience of working in the Digital Forensic field. Her areas of research include Artificial Intelligence, Human Computer Interaction, and Usability Engineering.

Table of Contents

1 Introduction to Artificial Intelligence

1.1 Introduction

1.2 Definition of AI

1.3 Goals of AI

1.4 Abridged History and Foundation of AI

1.5 Branches or Subareas of AI
1.6 Applications of AI
1.7 Categorization of AI
1.8 Components of AI
1.9 Current Trends in AI
1.10 AI Programming Languages
2 Intelligent Agents
2.1 Introduction
2.2 Intelligent Systems
2.3 The Concept of Rationality
2.4 Types of Agents
2.5 Environments and Its Properties
2.6 PEAS Representation for an Agent
2.7 Intelligent Agent Application
3 Problem Solving
3.1 Introduction to Problem Solving
3.2 Problem Formulation
3.3 State–Space Representation
3.4 Problem Formulation of the Eight Tile Puzzle
3.5 Problem Formulation of Water Jug Problem
3.6 Problem Formulation Vacuum Cleaner World Problem
3.7 Problem Formulation of Wumpus World Problem
3.8 Problem Formulation of Missionaries and Carnivals Problem
3.9 Production System
3.10 Difference between Conventional Problems and AI Problems
3.11 Searching
3.12 Problem Characteristics and Issues in the Design of Search Programs
3.13 Solving Problems by Searching
3.14 Types of Search Strategies
4 Uninformed Search Strategies
4.1 Introduction
4.2 Brute Force or Blind Search
4.3 Breadth-First Search
4.4 Depth-First Search
4.5 Difference between BFS and DFS
4.6 Uniform Cost Search
4.7 Depth-Limited Search
4.8 Iterative Deeping DFS

4.9 Bidirectional Search
4.10 Comparing Uniform Search Strategies
5 Informed Search
5.1 Introduction
5.2 Hill Climbing
5.3 Best-First Search (Greedy Search)
5.4 A* Search
5.5 AO* Search: (AND–OR) Graph
5.6 Memory Bounded Heuristic Search
5.7 Simulated Annealing Search
5.8 Local Beam Search
5.9 Branch and Bound Search
6 Adversarial Search
6.1 Introduction
6.2 Optimal Strategies
6.3 The Minimax Algorithm
6.4 Alpha–Beta Pruning
7 Constraint Satisfaction Problem
7.1 Introduction
7.2 General Form of the CSP
7.3 Map Colouring Problem
7.4 N-Queens Problem
7.5 N-Queens Problem Formulation
7.6 Forward Checking
7.7 Crypto Arithmetic Problem
8 Knowledge and Reasoning
8.1 A Knowledge-Based Agent
8.2 The Wumpus World
8.3 Knowledge Representation Issues
9 Predicate Logic
9.1 Representation of Simple Fact in Logic
9.2 Representing Instance and Is_A Relationship in Predicate Logic
9.3 Computable Functions and Predicate Logic
9.4 Resolution
9.5 Knowledge Engineering in First-Order Logic
9.6 Unification
9.7 Natural Deduction
10 Representation Knowledge Using Rules

10.1 Propositional Logic

10.2 Frist-Order Logic/Predicate Logic

10.3 Inference in First-Order Logic

10.4 Procedural versus Declarative Knowledge

10.5 Logic Programming

10.6 Forward and Backward Reasoning

10.7 Matching

10.8 Control Knowledge

10.9 Forward and Backward Chaining (Type of Reasoning)

11 Planning and Learning

11.1 Introduction

11.2 The Language of Planning Problems

11.3 Planning with State Space Search

11.4 Partial Ordered Planning

11.5 Hierarchical Planning

11.6 Conditional Planning

11.7 Learning Introduction

11.8 Forms of Learning

11.9 Inductive Learning

11.10 Learning Decision Trees

11.11 Ensemble Learning

11.12 Reinforcement Learning

12 Uncertain Knowledge and Reasoning

12.1 Uncertainty

12.2 Basic Probability Theorem

12.3 Joint Probability

12.4 Baye’s Theorem

12.5 Representing Knowledge in an Uncertain Domain (Bayesian Belief Network)

12.6 Simple Inference in Belief Network

12.7 Temporal Model

12.8 Markov Decision Process

13 Natural Language Processing

13.1 Introduction

13.2 Exponential

13.3 Natural Language for Communication

13.4 Syntactic Analysis

13.5 Argumented Grammar

13.6 Semantic Interpretation

14 Expert System
14.1 Expert System
14.2 Need and Justification of ES
14.3 Knowledge Representation
14.4 Knowledge Acquisition and Variation
14.5 Utilisation and Functionality
14.6 Basics of Prolog
15 Application
15.1 Introduction
15.2 Category of Applications of AI
15.3 Robotics
15.4 Artificial Neural Network
15.5 AI Trends in Various Sectors
15.6 More About Agents of AI
16 Cognitive Computing
16.1 Introduction
16.2 Foundation of Cognitive Computing
16.3 List of Design Principles for Cognitive Systems
16.4 Natural Language Processing in Support of a Cognitive System
17 Introduction to Soft Computing and Fuzzy Logic
17.1 Introduction
17.2 Soft Computing versus Hard Computing
17.3 Various Types of Soft and Hard Computing Techniques
17.4 Fuzzy Logic
17.5 Fuzzy Set versus Crisp Set
17.6 Membership Function
17.7 Fuzzy Rules
17.8 Fuzzy Reasoning
17.9 Fuzzy Inference System
17.10 Fuzzification
17.11 Defuzzification
17.12 Fuzzy Controllers
18 Artificial Neural Network
18.1 Introduction to Artificial Neural Networks
18.2 Basic Models of Artificial Neural Networks
18.3 First Artificial Neurons: McCulloch–Pitts Model
18.4 Neural Network Architecture
18.5 Single-Layer Feedforward ANN

18.6 Multilayer Feedforward ANN

18.7 Activation Functions

18.8 Supervised Learning

18.9 Delta Learning Rule

18.10 Backpropagation Algorithm

18.11 Unsupervised Learning Algorithm

18.12 Self-Organising Maps

18.13 Hybrid Approach: Fuzzy Neural Systems

Summary

Review Questions

Short-Type Questions

Multiple-Choice Questions

Answers

Further Readings

Index

To purchase this product, please visit:
https://www.wileyindia.com/artificial-intelligence-as-per-aicte-making-a-system-intelligent.html

Scan to buy