Computational Intelligence

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Product Description

Computational Intelligence Computational Intelligence serves as a comprehensive and insightful guide into a field that stands at the forefront of the rapidly evolving digital era, powering advancements from data analytics to autonomous systems. This book is dedicated to providing a structured yet accessible overview of Computational Intelligence (CI), a powerful paradigm that solves complex real-world problems by leveraging techniques inspired by natural intelligence. The core theme is the integration of diverse concepts, including artificial intelligence, machine learning, neural networks, evolutionary computing, and fuzzy logic. The text offers a careful balance between theoretical depth and practical relevance, ensuring that complex methodologies are made clear and engaging for a wide audience, which includes students, educators, researchers, and professionals. Chapters cover fundamental principles, key algorithms, and recent advancements, empowering readers to not only understand but also implement intelligent computational models. To foster practical knowledge, the book integrates real-world case studies and examples that demonstrate the application of CI techniques across crucial domains such as healthcare, finance, robotics, and optimization. By focusing on algorithmic design and real-time applications, this academically rigorous work inspires innovation and provides the tools necessary to contribute effectively to the future of intelligent computing. **Salient Features:**

- **Foundational AI Concepts**: Covers the principles of Artificial Intelligence, including its foundations, different types of AI, and the architecture and operation of various intelligent agents.
- **Neural Networks & Deep Learning**: Details the structure of Artificial Neural Networks (ANNs), Single/Multi-Layer Perceptrons, and modern Deep Learning algorithms, covering both supervised and unsupervised learning.
- **Fuzzy Logic & Hybrid Systems**: Explores Fuzzy Logic, Fuzzy Set Theory, and Fuzzy Reasoning, culminating in advanced hybrid models like Neuro-Fuzzy and Cooperative Fuzzy Neural Networks (CFNN).
- **Evolutionary Algorithms**: Provides an introduction to Genetic Algorithms, detailing concepts like search space, reproduction, and selection methods essential for optimization problems.
- **Swarm Intelligence Techniques**: Dedicated coverage of optimization algorithms inspired by collective behavior, including Particle Swarm Optimization (PSO) and Ant Colony Optimization (ACO) variants.
- **Practical Search Strategies**: Explains key Problem-Solving Agents and algorithms, differentiating between Uninformed and Informed search

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