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Nota di contenuto	The Emergence of Neuro-Symbolic Artificial Intelligence -- Neuro-Symbolic AI: The Fusion of Symbolic Reasoning and Machine Learning -- Neuro-Symbolic AI: The Integration of Continuous Learning and Discrete Reasoning -- Knowledge Representation in Artificial Intelligence -- Rule-based Systems and Expert Systems -- Knowledge Graphs: Representation and Reasoning -- Feedforward Neural Networks and Backpropagation -- Convolution in Neural Networks -- Recurrent Neural Networks (RNNs): Capturing the Dynamics of Sequences -- Overview of Neuro-Symbolic Integration Frameworks --

Learning from Symbolic Knowledge for Neural Networks -- Neural Extraction of Symbolic Knowledge -- Graph Neural Networks in Neural-Symbolic Computing -- Rule-based Reasoning in Neural Networks -- Common Sense Reasoning for Neuro-Symbolic AI -- Explainable and Trustworthy AI with Neuro-Symbolic Approaches -- Neuro-Symbolic AI in various Domains -- Towards Artificial General Intelligence? -- Learning and Reasoning over Higher Ordered Geometrical Structures -- Key Takeaways from Neuro-Symbolic AI.

Sommario/riassunto

This book highlights and attempts to fill a crucial gap in the existing literature by providing a comprehensive exploration of the emerging field of neuro-symbolic AI. It introduces the concept of neuro-symbolic AI, highlighting its fusion of symbolic reasoning and machine learning. The book covers symbolic AI and knowledge representation, neural networks and deep learning, neuro-symbolic integration approaches, reasoning and inference techniques, applications in healthcare and robotics, as well as challenges and future directions. By combining the power of symbolic logic and knowledge representation with the flexibility of neural networks, neuro-symbolic AI offers the potential for more interpretable and trustworthy AI systems. This book is a valuable resource for researchers, practitioners, and students interested in understanding and applying neuro-symbolic AI.