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Nota di contenuto	Chapter 1. New Ideas in Neuro Symbolic Reasoning and Learning -- Chapter 2. Brief Introduction to Propositional Logic and Predicate Calculus -- Chapter 3. Fuzzy and Annotated Logic for Neuro Symbolic Artificial Intelligence -- Chapter 4. LTN: Logic Tensor Networks -- Chapter 5. Neuro Symbolic Reasoning with Ontological Networks -- Chapter 6. LNN: Logical Neural Networks -- Chapter 7. NeurASP -- Chapter 8. Neuro Symbolic Learning with Differentiable Inductive Logic Programming -- Chapter 9. Understanding SATNet: Constraint Learning and Symbol Grounding -- Chapter 10. Neuro Symbolic AI for Sequential Decision Making -- Chapter 11. Neuro Symbolic Applications.
Sommario/riassunto	This book provides a broad overview of the key results and frameworks for various NSAI tasks as well as discussing important application areas. This book also covers neuro symbolic reasoning frameworks such as LNN, LTN, and NeurASP and learning frameworks. This would include differential inductive logic programming, constraint learning and deep symbolic policy learning. Additionally, application areas such a visual question answering and natural language processing are discussed as well as topics such as verification of neural networks and

symbol grounding. Detailed algorithmic descriptions, example logic programs, and an online supplement that includes instructional videos and slides provide thorough but concise coverage of this important area of AI. Neuro symbolic artificial intelligence (NSAI) encompasses the combination of deep neural networks with symbolic logic for reasoning and learning tasks. NSAI frameworks are now capable of embedding prior knowledge in deep learning architectures, guiding the learning process with logical constraints, providing symbolic explainability, and using gradient-based approaches to learn logical statements. Several approaches are seeing usage in various application areas. This book is designed for researchers and advanced-level students trying to understand the current landscape of NSAI research as well as those looking to apply NSAI research in areas such as natural language processing and visual question answering. Practitioners who specialize in employing machine learning and AI systems for operational use will find this book useful as well.