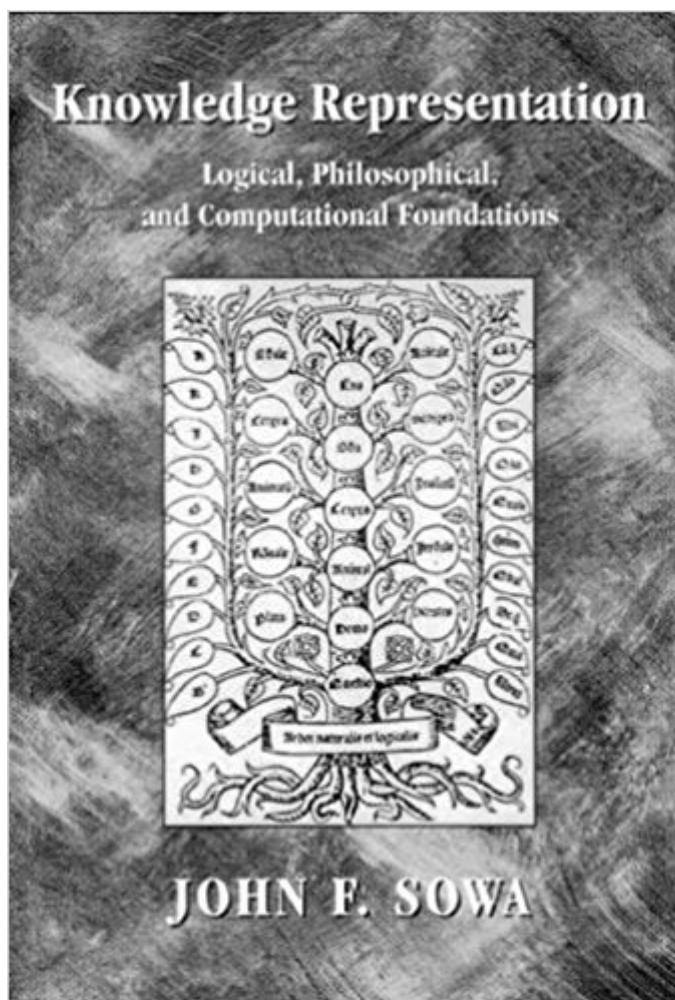


The book was found

Knowledge Representation: Logical, Philosophical, And Computational Foundations



Synopsis

John Sowa integrates logic, philosophy, linguistics, and computer science into this study of knowledge and its various models and implementations. His definitive new book shows how techniques of artificial intelligence, database design, and object-oriented programming help make knowledge explicit in a form that computer systems can use. The first three chapters are devoted to logic, ontology, and computable models of reality. Remaining chapters apply theories to the analysis of problems stated in ordinary language, and their translation to computable form. The text is self-contained, with each new idea defined when first mentioned; all formalism is developed in the body of the text or summarized in an appendix. Knowledge Representation is appropriate for advanced undergraduate and graduate students in computer science, as well as philosophy and linguistics students with some background in artificial intelligence or programming.

Book Information

Hardcover: 608 pages

Publisher: Brooks / Cole; 1 edition (August 17, 1999)

Language: English

ISBN-10: 0534949657

ISBN-13: 978-0534949655

Product Dimensions: 6.4 x 1.4 x 9.2 inches

Shipping Weight: 2.2 pounds

Average Customer Review: 4.1 out of 5 stars 3 customer reviews

Best Sellers Rank: #536,671 in Books (See Top 100 in Books) #163 in Books > Computers & Technology > Computer Science > Information Theory #172 in Books > Computers & Technology > History & Culture > History #173 in Books > Textbooks > Computer Science > Artificial Intelligence

Customer Reviews

1. Logic. 2. Ontology. 3. Knowledge Representation. 4. Processes. 5. Purposes, Contexts, And Agents. 6. Knowledge Soup. 7. Knowledge Acquisition And Sharing. Appendixes: Appendix A: Summary Of Notations Appendix B: Sample Ontology. Appendix C: Extended Example. Answers To Selected Exercises. Bibliography. Name Index. Subject Index. Special Symbols.

John Sowa is a Fellow of the American Association for Artificial Intelligence. He earned a bachelor's degree in Mathematics from MIT, a master's degree in Applied Mathematics from Harvard, and a

doctorate in Computer Science from the Vrije Universiteit Brussel. He has published and edited several books and dozens of articles on artificial intelligence and related topics.

There is real conceptual meat in this book, it is obviously the fruit of decades of thinking on this very hard topic. My only qualm is that it may be a little outdated by now. As far as I know there are better solutions to the Frames problem than the one outlined in the book. But as a place to start it is about as good as any for the time being, roughly on par with Russel and Norvig though more detailed on some aspects. Here is the table of contents, which I OCR'd.

Preface

CHAPTER ONE

Logic1.1 Historical Background

1.2 Representing Knowledge in Logic

1.3 Varieties of Logic

1.4 Names, Types, and Measures

1.5 Unity Amidst Diversity

CHAPTER TWO

Ontology

2.1 Ontological Categories

2.2 Philosophical Background

2.3 Top-Level Categories

2.4 Describing Physical Entities

2.5 Defining Abstractions

2.6 Sets, Collections, Types, and Categories

CHAPTER THREE

Knowledge Representations

3.1 Knowledge Engineering

3.2 Representing Structure in Frames

3.3 Rules and Data

3.4 Object-Oriented Systems

3.5 Natural Language Semantics

3.6 Levels of Representation

CHAPTER FOUR

Processes

4.1 Times, Events, and Situations

4.2 Classification of Processes

4.3 Procedures, Processes, and Histories

4.4 Concurrent Processes

4.5 Computation

4.6 Constraint Satisfaction

4.7 Change

CHAPTER FIVE

Purposes, Contexts, and Agents

5.1 Purpose

5.2 Syntax of Contexts

5.3 Semantics of Contexts

5.4 First-Order Reasoning in Contexts

5.6 Encapsulating Objects in Contexts

5.7 Agents

CHAPTER SIX

Knowledge Soup

6.1 Vagueness, Uncertainty, Randomness, and Ignorance

6.2 Limitations of Logic

6.3 Fuzzy Logic

6.4 Nonmonotonic Logic

6.5 Theories, Models, and the World

6.6 Semiotics

CHAPTER SEVEN

Knowledge Acquisition and Sharing

7.1 Sharing Ontologies

7.2 Conceptual Schema

7.3 Accommodating Multiple Paradigms

7.4 Relating Different Knowledge Representations

7.5 Language Patterns

7.6 Tools for Knowledge Acquisition

APPENDIX A

Summary of Notations

A.1 Predicate Calculus

A.2 Conceptual Graphs

APPENDIX B

Principles of Ontology

B.2 Top-Level Categories

B.3 Role and Relation Types

B.4 Thematic Roles

B.5 Placement of the Thematic Roles

APPENDIX C

Extended Example

C.1 Hotel Reservation System

C.2 Library Database

C.3 ACE Vocabulary

C.4 Translating ACE to Logic

Answers to Selected Exercises

Bibliography

Name Index

Subject Index

Special Symbols

In this book, John Sowa conveys diverse and effective insights within the field of knowledge representation (KR). The frameworks he employs are deeply grounded philosophically. (Sowa's previous work on conceptual structures reactivated and extended the innovative work of Charles Sanders Peirce, which integrates logic and graph theory.) The work reviewed here surveys a wide

range of KR issues from basic ontology to agency and processes. Chapter 6, Knowledge Soup, is widely recognized for framing and addressing some of the more demanding, and largely unresolved, challenges in the field. Throughout the book, issues are explored in a coherent, readable way. Of course, KR implies the use of relevant formalisms, and readers with some background in AI research will be better prepared to absorb the book's insights. However, for students and scholars looking for an integrated overview, Sowa makes a unique contribution.

I thought the first three chapters did an excellent job of covering advances in knowledge representation. However chapter four is marred by an attempt to present what appears to be virtually every syntax used relating to processes. Somewhere in this gulf of complexity I think he has some basic concepts, but they are hard to reach. It's equivalent to reading a book on algorithms in which the author presents the algorithms in C, Cobol, Fortran, Basic, SAS, etc. Why not just present the concepts within the context of a MINIMUM of syntax? Still the book is worth reading and has good appendixes.

[Download to continue reading...](#)

Knowledge Representation: Logical, Philosophical, and Computational Foundations Six Philosophical Works: A Priori Knowledge; Analytic vs. Formal Truth; Kant's Ethics; Philosophical Knowledge; What Is an Intention?; The Plan: The Complete Series The PowerScore LSAT Logical Reasoning Bible: A Comprehensive System for Attacking the Logical Reasoning Section of the LSAT The Mechanical Mind: A Philosophical Introduction to Minds, Machines and Mental Representation Organising Knowledge: Taxonomies, Knowledge and Organisational Effectiveness (Chandos Knowledge Management) Computational Fluid Mechanics and Heat Transfer, Third Edition (Series in Computational and Physical Processes in Mechanics and Thermal Sciences) Theoretical Neuroscience: Computational and Mathematical Modeling of Neural Systems (Computational Neuroscience Series) Simulating Enzyme Reactivity: Computational Methods in Enzyme Catalysis (Theoretical and Computational Chemistry Series) The Power of Computational Thinking: Games, Magic and Puzzles to Help You Become a Computational Thinker Current Topics in Computational Molecular Biology (Computational Molecular Biology) Computational Approaches to Protein Dynamics: From Quantum to Coarse-Grained Methods (Series in Computational Biophysics) Philosophical And Theoretical Perspectives For Advanced Nursing Practice (Cody, Philosophical and Theoretical Perspectives for Advances Nursing Practice) Philosophical Papers: Volume I (Philosophical Papers (Oxford)) Multiagent Systems: Algorithmic, Game-Theoretic, and Logical Foundations Three Philosophical Works: Theoretical Knowledge & Inductive Inference,

Popular Lectures on Logic, and Logic, Philosophy & Psychoanalysis Integrative Approaches to Psychology and Christianity, 3rd edition: An Introduction to Worldview Issues, Philosophical Foundations, and Models of Integratiton Integrative Approaches to Psychology and Christianity, Third Edition: An Introduction to Worldview Issues, Philosophical Foundations, and Models of Integratiton Historical and Philosophical Foundations of Education: A Biographical Introduction (5th Edition) Historical and Philosophical Foundations of Education: A Biographical Introduction (4th Edition) Defending the Axioms: On the Philosophical Foundations of Set Theory

[Contact Us](#)

[DMCA](#)

[Privacy](#)

[FAQ & Help](#)