

1. Record Nr.	UNINA9910453262803321
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Titolo	Description logic rules / / Markus Krotzsch
Pubbl/distr/stampa	Heidelberg, Germany : , : AKA : , : IOS Press, , 2010 ©2010
ISBN	1-61499-342-4
Descrizione fisica	1 online resource (275 p.)
Collana	Studies on the Semantic Web, , 1868-1158 ; ; Volume 008
Disciplina	006.332
Soggetti	Description logics Electronic books.
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Title Page; Preface; Contents; List of Figures; Introduction; Ontologies and the Semantic Web; Description Logics; What is a Rule?; Aims and Objectives; Guide to the Reader; Basic Definitions; First-Order Logic with Equality; Semantic Correspondences between Logical Theories; Computational Complexity; Introduction to Description Logics; The Description Logic SROIQ; Syntax; Semantics and Inferencing; Simplifications and Normal Forms; Relationship of DLs to Other Logics; Description Logic Nomenclature; Combining Description Logics with Datalog; Datalog as a First-Order Rule Language Syntax of Datalog; Semantics of Datalog; Equality; Datalog cup Description Logics: SWRL; Defining SWRL; Reasoning in SWRL; Approaches for Combining Rules and DLs; Rules and Conjunctive Queries; Extending Description Logics with Role Constructors; Introducing Role Expressions; Role Expressions for SROIQ and SHOIQ; Safe Role Expressions for SHIQ; A Tractable DL with Role Expressions; Summary; Related Work; Horn Logic Fragments of Description Logics; A Horn Fragment of SROIQ; A Light-Weight Horn-DL: Horn-FL0; PSpace-Complete Horn DLs: From Horn-FL- to Horn-FLOH-; Hardness; Containment Horn-SHIQ and Other ExpTime-Complete Horn DLs; Alternating Turing Machines; Simulating ATMs in Horn-FLE; Summary; Related Work; The Datalog Fragment of Description Logic; Initial Considerations and Problem Definition; The Datalog Fragment of ALC; Defining Description

Logic Programs; Emulating DLP in Datalog; Model Constructors for Datalog; Showing Structural Maximality of DLP; Summary; Related Work; Description Logic Fragments of SWRL: DL Rules; Initial Observations; Defining SROIQ Rules; Adding Role Constructors; Further Classes of DL Rules; Implementing DL Rules in Datalog; Summary Related WorkExtending DL Rules with DL-Safe Variables; Introducing DL-Safe Rules; DL Rules with Safe Variables; Reasoning Complexity of SROIQ+safe Rules; Tractable DL-Safe Rules: ELP; Summary; Related Work; Conclusions; Summary of the Results; Decidable Fragments of SWRL; Rule Fragments of Description Logics; Tractable Knowledge Representation Languages; Significance of the Results; Future Work; Bibliography; Index

Sommario/riassunto

Ontological modelling today is applied in many areas of science and technology, including the Semantic Web. The W3C standard OWL defines one of the most important ontology languages based on the semantics of description logics. An alternative is to use rule languages in knowledge modelling, as proposed in the W3C's RIF standard. So far, it has often been unclear how to combine both technologies without sacrificing essential computational properties. This book explains this problem and presents new solutions that have recently been proposed. Extensive introductory chapters provide the necessary
