1. Record Nr. UNINA9910809249603321

Autore	Lange Christoph
Titolo	Enabling collaboration on semiformal mathematical knowledge by semantic web integration / / Christoph Lange
Pubbl/distr/stampa	Heidelberg, Germany : , : IOS Press : , : AKA, , 2011 ©2011
ISBN	1-61499-345-9
Descrizione fisica	1 online resource (610 p.)
Collana	Studies on the Semantic Web, , 1868-1158 ; ; Volume 011
Disciplina	006.332
Soggetti	Knowledge representation (Information theory) Semantic Web Mathematics OMDoc (Document markup language)
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.
Nota di contenuto	Title Page; Contents; Abstract; Acknowledgments; Part I. Introduction; Chapter 1. Web Collaboration on Mathematical Knowledge; Current Practices of ""Doing Mathematics""; Enabling Management, Understanding, and Application of Mathematical Knowledge; Web 2.0 and Semantic Web in Science; Mathematics on the Web - State of the Art and Challenges; Collaborative Mathematics on the Web - Why Retry Now?; Challenges to be Addressed by a New MKM Infrastructure; Structure and Contribution of this Thesis; Part II. Knowledge Representation; Chapter 2. Representing Mathematical Knowledge Structures of Mathematical KnowledgeRequirements for Reusably Representing and Exchanging Mathematical Knowledge; Knowledge Representation on the [Semantic] Web (State of the Art); Representing Semiformal Mathematical Knowledge (State of the Art); Designing an Improved Representation and Exchange Language; Chapter 3. Ontologies for Structures of Mathematical Knowledge; Overview of the Ontologies by Structural Dimension; Logical and Functional Structures, and Notation; Rhetorical and Document Structures; Metadata; The Application Environment; Discussions about Knowledge Items Requirements for Extracting Structures from Semantic Markup to

RDFRelated Work; Conclusion and Future Work; Chapter 4. Using Mathematical Markup for Implementing and Documenting Expressive Ontologies; Problem and Requirements Statement; State of the Art; Implementing and Documenting Heterogeneous Ontologies in OMDoc; Implementation of the OMDoc Ontology; Case Study: Reimplementing FOAF in OMDoc; Related Work; Conclusion and Future Work; Chapter 5. Multi-Dimensional Metadata Markup; The Metadata Syntax of OMDoc 1.2 (State of the Art); The new OMDoc+RDFa Metadata Framework; Related Work
ConclusionPart III. Services and their Integration; Chapter 6. Primitive Services for Managing Mathematical Knowledge; Tasks, Scenarios, and Required Primitive Services; Editing; Validating; Human- and Machine-Comprehensible Publishing; Information Retrieval; Arguing about Problems and their Solutions; Conclusion; Chapter 7. Integrating Assistive Services into Interactive Documents; State of the Art and Related Work; Requirements for Integrating Services into Documents; The JOBAD Architecture; In-Document Client Services; Symbol-based Client Services; Expression-based Client Services
Conclusion and Future WorkChapter 8. Transparent Translations in Knowledge Bases; Extracting Structures from Semantic Markup; Migration to More Expressive Languages; Coping with Different Representation Granularities on Import and Export; Recommendations for Running Translations Transparently; Conclusion; Chapter 9. The Semantic Wiki SWiM - An Integrated Collaboration Environment; Wikis and Semantic Wikis (State of the Art); Requirements Analysis and Design Decisions; Architecture; How SWiM Supports OpenMath CD Maintenance Workflows; Related Work; Conclusion and Future Work Chapter 10. Usability Evaluation of an Integrated Environment for Maintaining Semiformal Collections

Sommario/riassunto

Mathematics is becoming increasingly collaborative, but software does not sufficiently support that: Social Web applications do not currently make mathematical knowledge accessible to automated agents that have a deeper understanding of mathematical structures. Such agents exist but focus on individual research tasks, such as authoring, publishing, peer-review, or verification, instead of complex collaboration workflows. This work effectively enables their integration by bridging the document-oriented perspective of mathematical authoring and publishing, and the network perspective of threaded