

# Contents

<b>1</b>	<b>Introduction</b> .....	<b>1</b>
	Alessandro Oltramari, Piek Vossen, Lu Qin, and Eduard Hovy	
<b>Part I Achieving the Interoperability of Linguistic Resources in the Semantic Web</b>		
<b>2</b>	<b>Towards Open Data for Linguistics: Linguistic Linked Data</b> .....	<b>7</b>
	Christian Chiarcos, John McCrae, Philipp Cimiano, and Christiane Fellbaum	
2.1	Motivation and Overview .....	8
2.2	Modelling Linguistic Resources as Linked Data .....	10
2.2.1	Modelling Lexical-Semantic Resources: WordNet .....	12
2.2.2	Modelling Annotated Corpora: MASC .....	14
2.3	Benefits of Linked Data for Linguistics .....	16
2.3.1	Structural Interoperability .....	17
2.3.2	Linking and Federation .....	18
2.3.3	Conceptual Interoperability .....	19
2.3.4	Ecosystem .....	20
2.3.5	Dynamic Import .....	20
2.4	Community Efforts Towards Lexical Linked Data .....	21
2.4.1	The Open Linguistics Working Group .....	21
2.4.2	W3C Ontology-Lexica Community Group .....	22
2.5	Summary .....	23
	References .....	24
<b>3</b>	<b>Establishing Interoperability Between Linguistic and Terminological Ontologies</b> .....	<b>27</b>
	Wim Peters	
3.1	Introduction .....	27
3.2	Linguistic Knowledge .....	29
3.3	Networking Linguistic Ontologies .....	31

3.4	Related Work .....	33
3.5	LingNet .....	34
3.5.1	The LingNet Model.....	34
3.5.2	LingNet Implementation .....	36
3.6	Discussion .....	38
3.7	Conclusion and Future Work .....	40
	References.....	41
<b>4</b>	<b>On the Role of Senses in the Ontology-Lexicon .....</b>	<b>43</b>
	Philipp Cimiano, John McCrae, Paul Buitelaar, and Elena Montiel-Ponsoda	
4.1	Introduction.....	43
4.2	Senses: Universal or Context-Specific? .....	46
4.3	Senses in the Ontology-Lexicon Interface .....	48
4.3.1	Senses as Reification .....	49
4.3.2	Sense as Subset of Uses .....	50
4.3.3	Sense as a Subconcept.....	50
4.3.4	The Three Facets .....	52
4.4	Systematic Polysemy in the Ontology-Lexicon Interface .....	52
4.5	Senses in the Ontology-Lexicon Model Lemon .....	55
4.5.1	Sense Properties .....	56
4.5.2	Contexts and Conditions .....	57
4.5.3	Sense Relations .....	59
4.6	Conclusions.....	60
	References.....	61

## Part II Event Analysis from Text and Multimedia

<b>5</b>	<b>KYOTO: A Knowledge-Rich Approach to the Interoperable Mining of Events from Text .....</b>	<b>65</b>
	Piek Vossen, Eneko Agirre, German Rigau, and Aitor Soroa	
5.1	Introduction.....	65
5.2	Packaging of Events .....	66
5.3	KYOTO Overview .....	69
5.4	Ontological and Lexical Background Knowledge .....	72
5.4.1	Ontology .....	73
5.4.2	Wordnet to Ontology Mappings .....	74
5.5	Off-Line Reasoning and Ontological Tagging .....	76
5.6	Event Extraction .....	77
5.7	Experimental Results.....	80
5.7.1	In-Depth Evaluation .....	80
5.7.2	Large Scale Evaluation .....	83
5.7.3	Transferring to Another Language.....	87
5.8	Conclusion .....	88
	References.....	89

<b>6</b>	<b>Anchoring Background Knowledge to Rich Multimedia</b>	
	<b>Contexts in the KNOWLEDGESTORE</b> .....	91
	R. Cattoni, F. Corcoglioniti, C. Girardi, B. Magnini, L. Serafini, and R. Zanolì	
6.1	Introduction .....	92
6.2	State of the Art .....	94
6.3	The KNOWLEDGESTORE Approach .....	96
6.3.1	Representation Layers .....	96
6.3.2	Content Processing .....	99
6.4	System Implementation .....	100
6.4.1	KNOWLEDGESTORE Core .....	100
6.4.2	Resource Preprocessing .....	101
6.4.3	Mention Extraction .....	102
6.4.4	Coreference Resolution .....	102
6.4.5	Mention–Entity Linking .....	104
6.4.6	Entity Creation and Enrichment .....	105
6.5	Experiments and Results .....	105
6.5.1	KNOWLEDGESTORE Population .....	106
6.5.2	Entity-Based Search .....	107
6.5.3	Contextualized Semantic Enrichment .....	108
6.6	Conclusions and Future Work .....	110
	References .....	111
<b>7</b>	<b>Lexical Mediation for Ontology-Based Annotation of Multimedia</b> ...	113
	Mario Cataldi, Rossana Damiano, Vincenzo Lombardo, and Antonio Pizzo	
7.1	Introduction .....	113
7.2	Related Work .....	115
7.3	Case Study: Annotating Stories in Video .....	117
7.4	Accessing Large Scale Commonsense Knowledge Through a Lexical Interface .....	121
7.4.1	The Architecture of CADMOS .....	121
7.4.2	The Meaning Negotiation Process .....	123
7.5	Annotation Test and Discussion .....	127
7.5.1	Experimental Setting .....	127
7.5.2	Results and Discussion .....	129
7.6	Conclusion .....	131
	References .....	132
<b>8</b>	<b>Knowledge in Action: Integrating Cognitive Architectures and Ontologies</b> .....	135
	Alessandro Oltramari and Christian Lebiere	
8.1	Introduction .....	135
8.2	Knowledge Mechanisms Meet Contents in Visual Intelligence ....	137
8.2.1	Mechanisms: Cognitive Architectures as Modules of Knowledge Production .....	137

8.2.2	Contents: Ontologies as Declarative Knowledge Resources .....	138
8.2.3	Human Visual Intelligence .....	139
8.3	<i>Making Sense of Visual Data</i> .....	141
8.3.1	HOMinE: Model and Implementation .....	142
8.3.2	The Cognitive Engine .....	146
8.3.3	Recognition Task .....	147
8.3.4	Description Task .....	149
8.4	Evaluation .....	150
8.5	Conclusions and Future Work .....	152
	References .....	152

### Part III Enhancing NLP with Ontologies

<b>9</b>	<b>Use of Ontology, Lexicon and Fact Repository for Reference Resolution in Ontological Semantics</b> .....	157
	Marjorie McShane and Sergei Nirenburg	
9.1	Introduction .....	157
9.2	Our View of Reference Resolution Versus Others .....	159
9.3	The OntoAgent Environment and Its Resources .....	161
9.3.1	Comparing OntoAgent Static Knowledge Resources with Others .....	164
9.3.2	The OntoSem Text Analyzer .....	165
9.4	The Reference Resolution Algorithm .....	166
9.4.1	Stage 1: Proper Name Analysis During Preprocessing ...	166
9.4.2	Stage 2: Detection of Potentially Missing Elements in the Syntactic Parse .....	167
9.4.3	Stage 3: Reference Processing During Basic Semantic Analysis .....	168
9.4.4	Stage 4: Running Lexically Recorded Meaning Procedures .....	172
9.4.5	Stage 5: Dedicated Reference Resolution Module .....	172
9.5	Final Thoughts: Semantics in Reference Resolution .....	181
	References .....	183
<b>10</b>	<b>Ontology-Based Semantic Interpretation via Grammar Constraints</b> .....	187
	Smaranda Muresan	
10.1	Introduction .....	187
10.2	Lexicalized Well-Founded Grammar .....	188
10.2.1	Semantic Molecule: A Syntactic-Semantic Representation .....	189
10.2.2	Semantic Composition and Interpretation as Grammar Constraints .....	191
10.2.3	LWFG Learning Model .....	192

10.3	Ontology-Based Semantic Interpretation .....	194
10.3.1	Levels of Representation .....	194
10.3.2	The Local Ontology-Based Semantic Interpreter .....	196
10.3.3	Global Semantic Interpreter .....	198
10.4	Knowledge Acquisition and Querying Experiments .....	199
10.4.1	Acquisition of Terminological Knowledge from Consumer Health Definitions .....	200
10.4.2	Natural Language Querying .....	202
10.5	Ambiguity Handling .....	203
10.6	Conclusions .....	205
	References .....	205
<b>11</b>	<b>How Ontology Based Information Retrieval Systems May Benefit from Lexical Text Analysis .....</b>	<b>209</b>
	Sylvie Ranwez, Benjamin Duthil, Mohameth François Sy, Jacky Montmain, Patrick Augereau, and Vincent Ranwez	
11.1	Introduction .....	210
11.2	Related Work .....	211
11.2.1	Conceptual Versus Keyword-Based IRSs .....	212
11.2.2	Hybrid Ontology Based Information Retrieval System ...	213
11.2.3	Concept Identification Through Lexical Analysis .....	218
11.3	Concept Identification Through Lexical Analysis: The “Synopsis” Approach .....	219
11.3.1	Concept Characterization .....	220
11.3.2	Thematic Extraction .....	222
11.4	Human Accessibility Enhanced at the Crossroads of Ontology and Lexicology .....	223
11.4.1	An Example of Concept-Based IRS: OBIRS .....	223
11.4.2	Ontology and Lexical Resource Interfacing Within Hybrid IRSs .....	225
11.5	Evaluation: User Feedback on a Real Case Study .....	226
11.6	Conclusion and Perspectives .....	227
	References .....	228

## **Part IV Sentiment Analysis Thorough Lexicon and Ontologies**

<b>12</b>	<b>Detecting Implicit Emotion Expressions from Text Using Ontological Resources and Lexical Learning .....</b>	<b>235</b>
	Alexandra Balahur, Jesús M. Hermida, and Hristo Tanev	
12.1	Introduction .....	235
12.2	Related Work .....	237
12.2.1	Appraisal Theories .....	237
12.2.2	Affect Detection and Classification in Natural Language Processing .....	237
12.2.3	Knowledge Bases for NLP Applications .....	238

12.2.4	Lexical Learning.....	238
12.2.5	Linking Ontologies with Lexical Resources .....	239
12.3	The EmotiNet Knowledge Base .....	239
12.3.1	Self-Reported Affect and the ISEAR Data Set .....	240
12.3.2	Building the EmotiNet Knowledge Base .....	240
12.3.3	Preliminary Extensions of EmotiNet .....	242
12.4	Further Extensions of EmotiNet with Lexical and Ontological Resources.....	244
12.4.1	Extending EmotiNet with Additional Emotion-Triggering Situations.....	244
12.4.2	Extending EmotiNet Using Ontopopulis .....	245
12.5	Evaluation .....	248
12.6	Discussion, Conclusions and Future Work.....	251
	References.....	253
<b>13</b>	<b>The Agile Cliché: Using Flexible Stereotypes as Building Blocks in the Construction of an Affective Lexicon.....</b>	<b>257</b>
	Tony Veale	
13.1	Introduction.....	257
13.2	Related Work and Ideas .....	259
13.3	Finding Stereotypes on the Web .....	261
13.3.1	Web-derived Models of Typical Behavior .....	263
13.3.2	Mutual Reinforcement Among Properties.....	265
13.4	Estimating Lexical Affect.....	266
13.5	In the Mood for Affective Search.....	269
13.6	Empirical Evaluation .....	270
13.6.1	Bottom Level: Properties and Behaviors of Stereotypes .....	270
13.6.2	Top Level: Stereotypical Concepts .....	271
13.6.3	Separating Words by Affect: Two Views .....	272
13.7	Conclusions.....	273
	References.....	274
	<b>Index.....</b>	<b>277</b>

New Trends of Research in Ontologies and Lexical  
Resources

Ideas, Projects, Systems

Oltramari, A.; Vossen, P.; Qin, L.; Hovy, E. (Eds.)

2013, XV, 282 p. 53 illus., 20 illus. in color., Hardcover

ISBN: 978-3-642-31781-1