

Contents

Part I The Matching Problem

1 Applications	3
1.1 Ontology Engineering	3
1.2 Information Integration	5
1.3 Linked Data	11
1.4 Peer-to-Peer Information Sharing	13
1.5 Web Service Composition	16
1.6 Autonomous Communication Systems	18
1.7 Navigation and Query Answering on the Web	20
1.8 Summary	23
2 The Matching Problem	25
2.1 Vocabularies, Schemas and Ontologies	25
2.2 Ontology Language	33
2.3 Types of Heterogeneity	37
2.4 Terminology	39
2.5 The Ontology Matching Problem	41
2.6 Summary	53
3 Methodology	55
3.1 The Alignment Life Cycle	56
3.2 Identifying Ontologies and Characterising Needs	57
3.3 Retrieving Existing Alignments	60
3.4 Selecting and Composing a Matcher	61
3.5 Matching Ontologies	63
3.6 Evaluating Alignments	64
3.7 Enhancing Alignments	66
3.8 Storing and Sharing	67
3.9 Rendering and Processing Alignments	68
3.10 Summary	68

Part II Ontology Matching Techniques

- 4 Classifications of Ontology Matching Techniques 73**
 - 4.1 Matching Dimensions 73
 - 4.2 Classification of Matching Approaches 75
 - 4.3 Classes of Concrete Techniques 79
 - 4.4 Other Classifications 82
 - 4.5 Summary 83
- 5 Basic Similarity Measures 85**
 - 5.1 Similarity, Distances and Other Measures 85
 - 5.2 Name-Based Techniques 87
 - 5.3 Internal Structure-Based Techniques 106
 - 5.4 Extensional Techniques 112
 - 5.5 Summary 120
- 6 Global Matching Methods 121**
 - 6.1 Relational Techniques 121
 - 6.2 Iterative Similarity Computation 130
 - 6.3 Matching as Optimisation 137
 - 6.4 Probabilistic Matching 140
 - 6.5 Semantic Techniques 145
 - 6.6 Summary 148
- 7 Matching Strategies 149**
 - 7.1 Ontology Partitioning and Search-Space Pruning 149
 - 7.2 Matcher Composition 153
 - 7.3 Context-Based Matching 156
 - 7.4 Similarity and Alignment Aggregation 160
 - 7.5 Matching Learning 172
 - 7.6 Matcher Tuning 180
 - 7.7 Alignment Extraction 186
 - 7.8 Alignment Improvement 192
 - 7.9 Summary 196

Part III Systems and Evaluation

- 8 Overview of Matching Systems 201**
 - 8.1 Schema-Based Systems 203
 - 8.2 Instance-Based Systems 233
 - 8.3 Mixed, Schema-Based and Instance-Based Systems 242
 - 8.4 Metamatching Systems 262
 - 8.5 Summary 269

9	Evaluation of Matching Systems	285
9.1	Evaluation Principles	285
9.2	Data Sets for Evaluation	291
9.3	Evaluation Measures	300
9.4	Application-Specific Evaluation	314
9.5	Summary	317
Part IV Representing, Explaining, and Processing Alignments		
10	Frameworks and Formats: Representing Alignments	321
10.1	Alignment Formats	321
10.2	Alignment Metadata	337
10.3	Alignment Frameworks	340
10.4	Summary	350
11	User Involvement	353
11.1	Individual Matching	353
11.2	Collective Matching	357
11.3	Explaining Alignments	360
11.4	Alignment Editors and Visualisers	369
11.5	Summary	375
12	Processing Alignments	377
12.1	Ontology Merging	378
12.2	Ontology Transformation	380
12.3	Data Translation	381
12.4	Data Interlinking	385
12.5	Mediation	387
12.6	Reasoning	389
12.7	Alignment Services and Repositories	390
12.8	Alignment Evolution	394
12.9	Summary	395
Part V Conclusions		
13	Conclusions	399
13.1	A Brief Outlook of the Trends in the Field	399
13.2	Future Challenges	401
13.3	Final Words	404
Appendix A	Legends of Figures	407
Appendix B	Running Example	409
Appendix C	Exercises	423
Appendix D	Solutions	431
References		463
Index		497



<http://www.springer.com/978-3-642-38720-3>

Ontology Matching

Euzenat, J.; Shvaiko, P.

2013, XVII, 511 p. 103 illus., 1 illus. in color., Hardcover

ISBN: 978-3-642-38720-3