

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