

# Contents

## Part I    The Matching Problem

<b>1</b>	<b>Applications</b>	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
<b>2</b>	<b>The Matching Problem</b>	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
<b>3</b>	<b>Methodology</b>	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

<b>4</b>	<b>Classifications of Ontology Matching Techniques</b>	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
<b>5</b>	<b>Basic Similarity Measures</b>	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
<b>6</b>	<b>Global Matching Methods</b>	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
<b>7</b>	<b>Matching Strategies</b>	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

<b>8</b>	<b>Overview of Matching Systems</b>	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

<b>9</b>	<b>Evaluation of Matching Systems</b>	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
<b>Part IV Representing, Explaining, and Processing Alignments</b>		
<b>10</b>	<b>Frameworks and Formats: Representing Alignments</b>	321
10.1	Alignment Formats	321
10.2	Alignment Metadata	337
10.3	Alignment Frameworks	340
10.4	Summary	350
<b>11</b>	<b>User Involvement</b>	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
<b>12</b>	<b>Processing Alignments</b>	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
<b>Part V Conclusions</b>		
<b>13</b>	<b>Conclusions</b>	399
13.1	A Brief Outlook of the Trends in the Field	399
13.2	Future Challenges	401
13.3	Final Words	404
<b>Appendix A Legends of Figures</b>		407
<b>Appendix B Running Example</b>		409
<b>Appendix C Exercises</b>		423
<b>Appendix D Solutions</b>		431
<b>References</b>		463
<b>Index</b>		497

Ontology Matching

Euzenat, J.; Shvaiko, P.

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

ISBN: 978-3-642-38720-3