

Contents

List of Contributors	XIII
1 XML: Model, Schemas, Types, Logics, and Queries	1
<i>Nils Klarlund, Thomas Schwentick, Dan Suciu</i>	
1.1 Introduction	1
1.2 XML Fundamentals	5
1.3 XML Schema Notations	11
1.4 Programming and Querying XML	18
1.5 The Theory of Regular Tree Languages	24
1.6 XML Query Languages versus Automata and Logic	27
1.7 Conclusion	36
References	37
2 Query Answering in Inconsistent Databases	43
<i>Leopoldo Bertossi, Jan Chomicki</i>	
2.1 Introduction	43
2.2 Consistent Query Answers	45
2.3 Query Transformation	53
2.4 Specifying Database Repairs	56
2.5 Computational Complexity	63
2.6 Aggregation Queries	65
2.7 Related Work	68
2.8 Conclusions and Future Work	76
References	78
3 Declarative Update Policies for Nonmonotonic Knowledge Bases	85
<i>Thomas Eiter, Michael Fink, Giuliana Sabbatini, Hans Tompits</i>	
3.1 Introduction	85
3.2 Preliminaries	88
3.3 Framework and Language	90
3.4 Properties	101
3.5 Implementation and Update Agents	113
3.6 Extensions	116
3.7 Related Work	121
3.8 Conclusion	125
References	126

4 Intelligent Agents: Issues and Logics	131
<i>John-Jules Ch. Meyer</i>	
4.1 Introduction	131
4.2 Issues	132
4.3 Epistemic and Doxastic Logic	134
4.4 Desires and Intentions	136
4.5 Cohen and Levesque's Logic of Intention	139
4.6 BDI Logic	145
4.7 KARO Logic	151
4.8 Logics for Multi-Agent Systems	157
4.9 Conclusion	162
References and Further Readings	162
5 Logic Based Approaches to Workflow Modeling and Veri- fication	167
<i>Saikat Mukherjee, Hasan Davulcu, Michael Kifer, Pinar Senkul, Guizhen Yang</i>	
5.1 Introduction	167
5.2 Preliminaries	170
5.3 Modeling Workflows with Temporal Logic	175
5.4 Modeling Workflows Using Event Algebra	180
5.5 Workflow Modeling Using Concurrent Transaction Logic	184
5.6 Other Uses of Logic in Workflow Modeling	197
5.7 Conclusion	198
References	200
6 Logical Data Expiration	203
<i>David Toman</i>	
6.1 Introduction	203
6.2 Framework for Data Expiration	205
6.3 Administrative Approaches to Data Expiration	211
6.4 Query-Driven Approaches to Data Expiration	214
6.5 Potentially Infinite Histories	231
6.6 Related Work	232
6.7 Conclusion	234
References	235
7 Description Logics for Modeling Dynamic Information	239
<i>Alessandro Artale, Enrico Franconi, Federica Mandreoli</i>	
7.1 Introduction	239
7.2 Conceptual Modeling of Dynamic Information	241
7.3 Description Logics	244
7.4 \mathcal{ER}_{VT} : A Formal Temporal Conceptual Model	248
7.5 An Object-Oriented Data Model for Evolving Schemas	261
7.6 Conclusion	272

References	273
8 Logics for Authorizations and Security	277
<i>Piero A. Bonatti, Pierangela Samarati</i>	
8.1 Introduction	277
8.2 Preliminaries on Security Formalizations	279
8.3 Logic-Based Policy Specification Languages	282
8.4 Policy Evaluation and Verification	313
8.5 Other Applications of Logic to Security	316
8.6 Conclusion and Perspective	317
References	319
9 Logical Languages for Data Mining	325
<i>Fosca Giannotti, Giuseppe Manco, Jef Wijsen</i>	
9.1 Introduction	325
9.2 The Search for Knowledge in Databases	327
9.3 Inductive Databases	332
9.4 Induction of Logic Programs	340
9.5 Multirelational Data Mining	347
9.6 A Vision of Convergence	352
9.7 Conclusion	355
References	356
Index	363