

Contents

Preface	v
About the Author	xvii
Chapter 1: Intelligent Multimedia	
1. Introduction.....	1
1.1. The Area.....	1
1.2. Intelligent Multimedia Knowledge Representation.....	4
1.3. Organization of the Chapters	8
References	10
Chapter 2: Creative Multimedia Techniques	
1. Introduction.....	13
2. Creative Techniques.....	13
3. Virtual Reality	14
4. Introduction to Motion Pictures	15
4.1. Basic Morphs and Motion Pictures.....	15
4.2. Animation Techniques	17
4.3. Practical Level Knowledge Representation and Morphs	17
4.4. Flash MX	18
Exercises.....	20
References.....	21
Chapter 3: Artificial Intelligence and Intelligent Multimedia Object Paradigms	
1. Introduction.....	23
2. Artificial Intelligence	24
3. Agents	24
4. A Multimedia AI System	24
5. Aesthetics and World Models.....	25
5.1. Context	26
5.2. Visual Object Perception Dynamics	26
5.3. Hybrid IM Morphing	27
6. A High Level Multimedia Language and Paradigm.....	27
6.1. Agent Object Oriented Programming	29
6.2. The Agent Process Model	29
6.3. Computing on Trees	30
6.4. Programming Linguistics and Intelligent Syntax	30
6.5. Intelligent Object Level Programs.....	31
6.6. The Objects KR Paradigm	32
6.7. Canonical Concurrency Calculus	33
7. Virtual Visual Java	33
7.1. Mobile Visual Object Computing	33
Exercises.....	33
References.....	34

Chapter 4: Basic Intelligent Multimedia Techniques

1. Introduction.....	37
2. Hybrid Pictures	37
3. Morphing and Trans-Morphing	38
4. Intelligent Languages.....	40
5. Planning and Morphs with IM.....	41
6. Practical AI Goal Satisfaction	41
7. Virtual Model-Based Computing	42
Exercises.....	44
References.....	44

Chapter 5: Agent Computing and Intelligent Multimedia

1. Introduction.....	48
2. The Agent Models and Desire.....	48
2.1. Mental Attitudes	49
2.2. Specifying Beliefs, Intentions, Desire Model Agents	50
3. Dynamics and Situations	50
3.1. Worlds and A Robot's Touch	50
3.2. Computational Illusion and Virtual Reality.....	51
3.3. Representing AI Worlds	52
3.4. Computable World Models	52
3.5. AI Model Diagrams	52
3.6. Cognitive Modelling	53
3.7. Extensions and Models	54
3.8. Situations and Possible Worlds.....	54
3.9. Epistemic States and Ordinal Dynamics.....	55
3.10. Generic Encoding and Epistemology.....	56
3.11. Cardinality and Concept Descriptions.....	57
3.12. Deduction Models and Perceptual Computing.....	57
4. Intelligent Interfaces	58
4.1. Affective Computing and Multimedia Cognition.....	58
4.2. Knowledge-based Intelligent Interfaces.....	59
5. Context	59
5.1. Models and Syntax	60
5.2. Agent Linguistics	61
5.3. Meta-Contextual Reasoning.....	61
5.4. KR, Models, and Context.....	61
5.5. Diagrams and Incomplete Knowledge	62
6. Multiagent Visual Planning.....	62
6.1. Intelligent Trees and Spatial KR.....	62
6.2. Virtual Trees and Planning with Models.....	63
6.3. Virtual Trees	66
6.4. Morph Gentzen Virtual Reality	66
6.5. Spatial Information and Morph Gentzen.....	67
Exercises.....	67
References.....	68

Chapter 6: The Mathematical Foundations

1. Introduction.....	73
2. The Morph Gentzen Logic.....	74
2.1. Intelligent Syntax and Models.....	74
2.2. Basic Models, Completeness, and Morphisms.....	75
3. Morphed Gentzen Virtual Computing.....	76
3.1. Computing on Trees.....	76
3.2. G-Diagrams for Initial Models.....	77
3.3. Intelligent Trees.....	79
3.4. Intelligent Models.....	79
4. Virtual Plan Computing.....	79
4.1. Proof Trees.....	79
4.2. Virtual Plans.....	80
5. Morph Gentzen, KR, and Models.....	81
5.1. Knowledge Representation (KR).....	81
5.2. Representing Relevant Knowledge.....	81
5.3. Further Diagrammatic Logics.....	82
Exercises.....	83
References.....	83

Chapter 7: Intelligent Visual Databases and Data Mines

1. Introduction.....	86
1.1. Where is Multimedia Data Mines?.....	86
1.2. DM with Correlation Signatures.....	87
1.3. Learning and Multimedia Content.....	87
1.4. Learning Multimedia Content Semantics.....	88
2. The Visual Dynamics.....	88
2.1. Why Multimedia Databases?.....	88
2.2. KR and Diagrams for Relevant World Models.....	89
3. A Visual Computing Logic.....	90
3.1. Intelligent Models.....	90
3.2. Relevant KR and Visual Business Objects.....	91
3.3. Learning from Multimedia Data.....	91
3.4. Computable World Models.....	91
4. Heterogeneous Computing Models.....	91
4.1. Heterogeneous Computing.....	91
4.2. KR, Knowledge Base, and Visual Model Discovery.....	92
4.3. Prediction and Discovery.....	92
4.4. TAIM and Discovery from Warehoused Data.....	92
4.5. KR and Data Warehousing with Keyed Functions.....	93
4.6. Competitive Models and Multiplayer Games.....	94
4.7. The Stock Traders Interface Model.....	94
4.8. The Visual Database Asset Management Model.....	95
4.9. Multimedia Middleware Databases UI Wrappers.....	95
5. The Applications to DM and Knowledge Management.....	95
5.1. Agent DM.....	95
5.2. TAIM-based Agent DataWarehouse.....	96

5.3. Correlation Signatures	97
5.4. Knowledge Management (KM)	97
6. Conclusions	99
Exercises	99
References	100

Chapter 8: The Applications to Business and E-Commerce

1. Introduction	103
2. Planning with Prediction	104
2.1. Prediction and Discovery	104
2.2. KR with Keyed Functions	105
3. Competitive Models and Games	106
3.1. Intelligent AND/OR Trees and Search	106
3.2. Two-Person Games	107
3.3. Management Process Models	107
3.4. Decision Trees	108
4. Conclusions	109
Exercises	109
References	110

Chapter 9: Spatial Heterogeneous Visual Computing

1. Introduction	111
2. Multiagent Visual Lanning	112
3. The Spatial Multiagent Navigator	114
4. The Autonomous Enterprise	114
4.1. Plans and Tasks	114
4.2. The Planning Picture	115
4.3. Practical Standard Planning Problems	115
4.4. The Newer Planning Projects	115
4.5. Plans and Schedules for Spacecrafts	115
4.6. Planning and Control Abstraction	116
5. Planning and Spatial Navigation	117
6. Virtual Worlds, Models, and Plans	117
6.1. Relevant Worlds	117
6.2. Virtual Trees	118
6.3. Morph Gentzen Virtual Reality	119
6.4. Intelligent Trees and Spatial KR	119
7. Spatial Morph Gentzen	120
7.1. The Spatial Multiagent Navigator	120
7.2. Multiagent Visual Planning	120
7.3. The Intelligent Multimedia Beliefs, Intentions, Desire Model	120
Exercises	121
References	121

Chapter 10: Knowledge Representation and Predictive Intelligent Multimedia Diagram Models

1. Introduction	123
2. Knowledge Representation and Intelligent Multimedia Specifics	124

3. Computable AI World Models.....	125
3.1. Relevant Worlds and KR.....	125
3.2. Representing World Models by G-diagrams.....	125
3.3. KR on Diagrams and Partial Deductions.....	126
4. Generalized Diagrams and Relevant Worlds.....	126
4.1. Generalized Diagrams.....	126
4.2. Diagrams for World Computing.....	128
4.3. Diagrams and Incomplete Knowledge KR.....	128
4.4. Generalized Free Skolem Diagrams.....	129
4.5. Predictive Diagrams for KR.....	129
4.6. New Applications.....	130
5. Models and Proof Computation.....	131
5.1. Discovery Computation as Plan Proof Trees.....	131
5.2. Generic Free Skolemized, Discovery, and Proof Abstraction.....	132
5.3. Initial Models.....	132
6. Descriptive Computing.....	133
6.1. The Basics.....	133
6.2. Boolean Computing Diagrams.....	134
7. Conclusion.....	134
Exercises.....	135
References.....	135

Chapter 11: Business Intelligence, Content Exploration, and Intelligent Interfaces

1. Introduction.....	138
2. The Visual Dynamics.....	138
2.1. Why Multimedia Databases?.....	138
3. The Models.....	139
3.1. Intelligent Models.....	139
3.2. Relevant KR and Visual Business Objects.....	139
3.3. Learning from Multimedia Data.....	139
3.4. Computable World Models.....	140
4. Heterogeneous Computing and Models.....	140
4.1. Heterogeneous Computing.....	140
4.2. KR, KB, and Visual Model Discovery.....	140
4.3. Prediction and Discovery.....	140
4.4. TAIM and Discovery from Warehoused Data.....	141
4.5. KR and Data Warehousing with Keyed Functions.....	142
4.6. The Stock Traders Interface Model.....	143
4.7. The Visual DB Asset Management Model.....	144
4.8. Multimedia Middleware DB and Wrappers Interfaces.....	144
4.9. Content Management System with TAIM.....	144
4.10. Tiers and Remote Invocation Basics.....	145
5. Enterprise Resource Planning.....	145
5.1. Infinite Multiplayer Game Trees and ERP.....	147
5.2. Intelligent AND/OR Trees and Splitting Agents.....	147

6. Business Intelligence, KM, and Content Retrieval.....	148
6.1. Business Intelligence and Data Warehousing.....	148
6.2. IM Knowledge Management.....	148
6.3. Indexing Multimedia Content.....	150
6.4. Information Retrieval.....	150
7. Conclusions.....	150
Exercises.....	151
References.....	151

Chapter 12: Heterogeneous Computing, Agent-based Structures, and Implementations

1. Introduction.....	153
2. Specifying Multiagent Systems.....	155
3. The Formal Basis.....	156
3.1. Agents.....	156
3.2. Agent Morphisms and Module Preservation.....	157
3.3. Agents, Modules, and Algebras.....	157
3.4. Agents, Languages, and Models.....	158
4. Multiagent if Designs and Mediators.....	159
5. AI and Concurrent Agent Processes Computing.....	161
6. Abstract Implementation by Computing Agents.....	162
7. Agent Ontology Preservation Theorems.....	163
References.....	163

Chapter 13: Abstract Planning, Models, and Virtual Trees

1. Introduction.....	165
2. Computable World Models.....	166
3. AI World Diagrams.....	166
4. Planning with Generic Free Skolemized-Diagrams.....	167
4.1. Nondeterministic Diagrams.....	167
4.2. Generalized Free Skolem Diagrams.....	168
4.3. Planning.....	169
5. Generalized Proofs and Hilbert Models.....	170
6. Ordinal Planning with GF-Diagrams.....	171
7. GF Plans and Generalized Free Proofs.....	171
7.1. GF Plans and Proof Abstraction.....	171
7.2. Proofs Trees and Hilbert Models.....	172
7.3. Recursion and Robots.....	172
8. Visual Planning.....	173
8.1. Morph Gentzen VR.....	173
8.2. Intelligent Trees and Spatial KR.....	173
8.3. Spatial Information and Morph Gentzen.....	173
8.4. Visual Context and Objects.....	174
8.5. Multiagent Visual Planning.....	174
8.6. Model Functions and Visual Objects.....	174
9. Conclusions.....	175
Exercises.....	175
References.....	176

Chapter 14: Intelligent Cyberspace Interfaces and Wireless Access Protocol Generic Computing

- 1. Introduction 177
- 2. Heterogeneous Computing and Wireless Access Protocol 178
 - 2.1. Agent Language Processing and Models 178
 - 2.2. Authentication and the World Wide Web 179
 - 2.3. Agent Language Processing..... 180
 - 2.4. Intelligent Trees and the WWW 180
- 3. Mobile Agents and Java..... 181
 - 3.1. Mobile Agents and WWW..... 181
 - 3.2. Cyberspace Safety 182
- 4. Cyberdocking via Mobile Interfaces..... 182
 - 4.1. Mobile Agents and WWW..... 183
 - 4.2. Authentication Header 183
 - 4.3. Virtual Generic Virtual Private Network and WAP 184
- 5. KR, KB, and Visual WWW Interfaces 184
 - 5.1. Content Management 185
- Exercises 186
- References..... 186