
Contents

Introduction	xi
Sahbi SIDHOM and Amira KADDOUR	
Chapter 1. Multi-Agent System and Ontology to Manage Ideas and Represent Knowledge: Creativity Challenge	1
Pedro Chávez BARRIOS, Davy MONTICOLO and Sahbi SIDHOM	
1.1. Introduction	1
1.2. Multi-agent system (MAS) and ontology	3
1.2.1. MAS and ontology	3
1.2.2. MAS methodologies	5
1.2.3. Methodologies to design ontologies	6
1.3. MAS and ontology: our approach proposal	7
1.3.1. MAS methodology GAIA	7
1.3.2. Applying the ontology, Uschold's ontology	8
1.4. Results	9
1.4.1. Multi-agent system results	9
1.4.2. Ontology results	13
1.5. Conclusion	16
1.6. Appendices	16
1.7. References	22
Chapter 2. Comparative Study of Educational Process Construction Supported by an Intelligent Tutoring System	27
Walid BAYOUNES, Inès BAYOUDH SÂADI and Hénda BEN GHÉZALA	
2.1. Introduction	27
2.2. New view of educational process	28
2.2.1. Psycho-pedagogical level	30

2.2.2. Didactic level	30
2.2.3. Situational level	30
2.2.4. Online level	30
2.3. Definition framework	30
2.3.1. Didactic domain world	31
2.3.2. Instructional design world	32
2.3.3. Learning environment world	33
2.3.4. Learning situation world	34
2.4. Comparative study	34
2.4.1. Study scope	34
2.4.2. Description of systems	35
2.4.3. Specification of approaches	36
2.4.4. Study results and discussion	50
2.5. Conclusion and future works	51
2.6. References	52
 Chapter 3. Multi-Criteria Decision-Making Recommender System Based on Users' Reviews	55
Mariem BRIKI, Sabrine BEN ABDRABBAH and Nahla BEN AMOR	
3.1. Introduction	55
3.2. Multi-criteria decision-making	56
3.3. Basics of recommendation systems and related work	58
3.3.1. Recommender systems	58
3.3.2. Text mining-based recommendation systems	59
3.3.3. Multi-criteria recommender systems	60
3.4. New multi-criteria text-based recommendation system	62
3.4.1. Primary criterion-based recommendation system	62
3.4.2. Multi-criteria text mining-based recommendation system	66
3.5. Experimental study	67
3.5.1. Dataset and metrics	67
3.5.2. Evaluation metrics	68
3.5.3. Experimental protocol	69
3.5.4. Experimental results	70
3.6. Conclusion	71
3.7. References	72
 Chapter 4. Spammer Detection Relying on Reviewer Behavior Features Under Uncertainty	75
Malika BEN KHALIFA, Zied ELOUEDI and Eric LEFÈVRE	
4.1. Introduction	75
4.2. Background	78

4.2.1. The belief function theory	78
4.2.2. Evidential K-nearest neighbors	80
4.3. Spammer detection relying on the reviewers' behavioral features	81
4.3.1. Step 1: Features extraction	82
4.3.2. Step 2: Initialization and learning phase	87
4.3.3. Step 3: Distinguishing between innocent and spammer reviewers	88
4.4. Experimental study	89
4.4.1. Evaluation protocol	90
4.4.2. Results and discussion	91
4.5. Conclusion and future work	92
4.6. References	92
Chapter 5. Social Networking Application, Connections Between Visual Communication Systems and Personal Information on the Web	97
Marilou KORDAHI	
5.1. Introduction	97
5.2. Related published works	100
5.3. Pattern for the SignaComm, first approach	101
5.3.1. SignaComm's context	102
5.3.2. SignaComm's pattern	103
5.4. From text phrases to signograms for the protection of personal data	107
5.4.1. Automatic translation	107
5.4.2. Dictionary of signograms	109
5.5. SignaComm's first technical test	110
5.5.1. Interface pattern	110
5.5.2. User profile pattern	111
5.5.3. Machine translation pattern	111
5.5.4. Activity pattern	113
5.6. Discussion and conclusion	113
5.7. Acknowledgment	114
5.8. References	114
Chapter 6. A New Approach of Texts and Writing Normalization for Arabic Knowledge Organization	119
Hammou FADILI	
6.1. Introduction	119
6.2. Motivation	120

6.3. Using a machine learning model	120
6.4. Technological elements integration	124
6.5. Corpus and dataset	126
6.6. Experiences and evaluations	127
6.6.1. Results	129
6.7. Conclusion	130
6.8. References	131
Chapter 7. Ebola Epidemic in the Congo 2018–2019: How Does Twitter Permit the Monitoring of Rumors?	137
Marc TANTI	
7.1. Introduction	137
7.2. Materials and methods	139
7.3. Results	143
7.3.1. Regarding the general public, the citizens	143
7.3.2. Regarding the experts	145
7.3.3. Regarding the media	146
7.3.4. Regarding the politicians	148
7.4. Conclusion	149
7.5. Acknowledgment	150
7.6. References	150
Chapter 8. From Human and Social Indexing to Automatic Indexing in the Era of Big Data and Open Data	153
Nabil KHEMIRI and Sahbi SIDHOM	
8.1. Introduction	153
8.2. Indexing definition	154
8.3. Manual indexing	155
8.4. Automatic indexing	156
8.4.1. Statistical indexing methods	156
8.4.2. Linguistic indexing methods	157
8.4.3. Semantic indexing	158
8.4.4. Social indexing	159
8.5. Indexing methods for Big Data and Open Data	159
8.6. Conclusion	161
8.7. References	161

Chapter 9. Strategies for the Sustainable Use of Digital Technology by the AWI in the Management of Knowledge and Cultural Communication on the “Arab World”	165
Asma ABBASSI	
9.1. Introduction	165
9.2. The Arab World Institute and the construction of knowledge around the “Arab World” in the West	166
9.3. The AWI’s digital communication strategies	168
9.4. The images built by the AWI and the question of feedback	176
9.5. The role of digital tools in sustainability and durability in the management of knowledge and communication at the AWI	178
9.6. Conclusion	180
9.7. References	181
List of Authors	185
Index	187

