

Table of Contents

Foreword	xi
Alain JUILLET	
Introduction	xvii
Philippe CAPET and Thomas DELAVALLADE	
Chapter 1. Information: Philosophical Analysis and Strategic Applications	1
Mouhamadou El Hady BA and Philippe CAPET	
1.1. Introduction	1
1.2. State of the art in philosophy	2
1.2.1. History.	3
1.2.2. Information at the crossroads between epistemology and philosophy of language	5
1.3. Information warfare	15
1.3.1. The role of falsehood and of intentions.	17
1.3.2. Deception, simulation and dissimulation.	19
1.3.3. Addressees of information or the art of communicating.	24
1.3.4. Information warfare as a play on beliefs.	25
1.3.5. Disinformation and associated notions.	26
1.4. Conclusion. Comprehending information in order to evaluate it	31
1.5. Bibliography.	32

Chapter 2. Epistemic Trust	35
Gloria ORIGGI	
2.1. Introduction	35
2.2. What is social epistemology?	36
2.3. History of the discipline	39
2.4. Social epistemology and externalism	40
2.5. Realism and constructivism in social epistemology	41
2.6. Believing other people	43
2.7. Reductionism and antireductionism	45
2.8. Trust and communication	49
2.9. Conclusion	51
2.10. Bibliography	52
Chapter 3. The Fundamentals of Intelligence	55
Philippe LEMERCIER	
3.1. Introduction	55
3.2. Information evaluation in the language of intelligence	56
3.2.1. A context which is not clearly defined, open to multiple interpretations	56
3.2.2. An informational model historically based on the evaluation of information and of sources	64
3.3. Attempt to formalize generic models appropriate for the new issues facing the intelligence services	76
3.3.1. Functional analysis as a support for definition	76
3.3.2. Paradigm shifts	77
3.3.3. Attempt at a rigorous definition of intelligence	87
3.4. Conclusion	99
3.5. Bibliography	100
Chapter 4. Information Evaluation in the Military Domain: Doctrines, Practices and Shortcomings	103
Philippe CAPET and Adrien REVAULT D'ALLONNES	
4.1. Introduction	103
4.2. Presentation of the existing situation	104
4.2.1. Information evaluation in the intelligence cycle	105
4.2.2. Reliability and credibility of information	108
4.3. Illustrative scenario with multi-sourced information	110

4.4. From an inaccurate definition to an attractive but unusable concept	112
4.4.1. Estimation of reliability	112
4.4.2. Estimation of credibility	115
4.4.3. Combining dimensions – what is the comparability of the ratings?	119
4.4.4. Raw data, enriched intelligence – can information evaluation qualify everything?	121
4.5. A few suggested refinements to information evaluation techniques	122
4.6. Conclusion and future prospects	124
4.7. Bibliography	125

Chapter 5. Multidimensional Approach to Reliability Evaluation of Information Sources 129

Frédéric PICHON, Christophe LABREUCHE,
Bertrand DUQUEROIE and Thomas DELAVALLADE

5.1. Introduction	129
5.2. Multi-criteria aggregation by the Choquet integral: application to the evaluation of the reliability of sources	132
5.2.1. Multi-criteria decision support	133
5.2.2. Multi-Attribute Utility Theory	134
5.2.3. Concepts of measurement and construction of utility functions	135
5.2.4. Aggregation function A: limitations of the weighted sum	137
5.2.5. The Choquet integral	138
5.2.6. Determination of the aggregation function A	139
5.2.7. Multi-level preference models	140
5.2.8. Estimation of a degree of reliability via the multi-criteria approach	141
5.3. Reliability of sources on Twitter	142
5.3.1. Twitter	142
5.3.2. Reliability of sources on Twitter: state of the art	143
5.4. Multi-criteria model for the reliability of Twitter accounts	148
5.5. Conclusion	156
5.6. Bibliography	156

Chapter 6. Uncertainty of an Event and its Markers in Natural Language Processing	161
Mouhamadou El Hady BA, Stéphanie BRIZARD, Tanneguy DULONG and Bénédicte GOUJON	
6.1. Introduction	161
6.2. State of the art	162
6.2.1. Detection of named entities	162
6.2.2. Detection of events	164
6.2.3. Detection of uncertainty	164
6.3. Model for representing the uncertainty of an event	168
6.3.1. Named entity model	168
6.3.2. Event model	168
6.3.3. Uncertainty model	169
6.4. Linguistic resources	172
6.4.1. Technological context	172
6.4.2. Development and test corpora	172
6.4.3. Linguistic resources for named entity recognition.	173
6.4.4. Linguistic resources for event extraction	174
6.4.5. Linguistic resources for uncertainty extraction.	176
6.5. Realization	181
6.6. Conclusions and perspectives	182
6.7. Bibliography	184
Chapter 7. Quantitative Information Evaluation: Modeling and Experimental Evaluation.	187
Marie-Jeanne LESOT, Frédéric PICHON and Thomas DELAVALLADE	
7.1. Introduction	187
7.2. Formal framework used: possibility theory	190
7.2.1. Reasons for using possibility theory	190
7.2.2. Recap of possibility theory	192
7.2.3. Aggregation operators for possibility distributions	194
7.2.4. Application to information evaluation.	197
7.3. Proposed architecture	198
7.3.1. General principle	199
7.3.2. Inputs to the process of information evaluation	200
7.3.3. Evaluation of individual elements	206
7.3.4. Fusion of individual ratings	209
7.4. Experimental study	212
7.4.1. Realistic generation of the uncertainty of a source	213
7.4.2. Description of the experiments	217

7.4.3. Measures of quality	221
7.4.4. Results	222
7.5. Conclusions	226
7.6. Bibliography.	228
Chapter 8. When Reported Information Is Second Hand	231
Laurence CHOLVY	
8.1. Introduction	231
8.2. Domains involved and related works	234
8.2.1. Document mining on the Web	234
8.2.2. Military intelligence	234
8.2.3. Analysis of press reports	235
8.2.4. Modal logic, validity and completeness of information sources	236
8.2.5. Modal logic and modeling of lying	238
8.3. A logical model to decide whether reported information is credible	239
8.3.1. Logical formalism	240
8.3.2. One level of imbrication	241
8.3.3. Two levels of imbrication.	243
8.3.4. Conclusion about the logical model.	245
8.4. Taking account of uncertainty. A model for estimating the degree of credibility of a reported piece of information.	245
8.4.1. The numerical model	246
8.4.2. One level of imbrication	247
8.4.3. Two levels of imbrication.	249
8.4.4. Conclusion about the numerical model.	251
8.5. Use of the logical model to generate hypotheses about the information sources	251
8.5.1. Motivation	251
8.5.2. An algorithm to generate responses	253
8.5.3. Illustration.	253
8.5.4. Conclusion about the generation of hypotheses.	254
8.6. Conclusion.	255
8.7. Supplements	256
8.7.1. Main notions of logic	256
8.7.2. Main notions from the Theory of Evidence	258
8.8. Bibliography.	259

Chapter 9. An Architecture for the Evolution of Trust: Definition and Impact of the Necessary Dimensions of Opinion Making	261
Adrien REVAULT D' ALLONNES	
9.1. Introduction	261
9.2. A perspective on trust	262
9.3. Dimensions of information evaluation	263
9.4. General evaluation of the source: reliability	269
9.4.1. Evaluation of reliability in the original scenario	270
9.5. Contextual evaluation of the source: competence	271
9.5.1. Evaluation of competence in the original scenario	271
9.6. General content evaluation: plausibility	272
9.6.1. Evaluation of plausibility in the original scenario	273
9.7. Contextual content evaluation: credibility	273
9.7.1. Evaluation of credibility in the original scenario	275
9.8. Global expression of trust	275
9.9. Architecture of information evaluation: characteristics	276
9.9.1. Order of integration of the dimensions	277
9.9.2. Sequentiality of the information evaluation chain	279
9.10. Architecture of information evaluation: a description	279
9.10.1. Reminders about the evaluation of the dimensions	280
9.10.2. Reliability of the source	280
9.10.3. Competence and plausibility	281
9.10.4. Credibility	282
9.11. Personalization of information evaluation: modeling levels of gullibility	283
9.11.1. Reliability of the source	284
9.11.2. Competence and plausibility	285
9.11.3. Credibility	287
9.11.4. Discussion	288
9.12. Conclusion	290
9.13. Bibliography	291
List of Authors	295
Index	297