

# CONTENTS

|   |      |
|---|------|
| List of Contributors  | vii  |
| List of Figures and Tables  | xiii |
|   |      |
| Introduction: Philosophy's Relevance in Computing and Information Science – <i>Ruth Hagengruber and Uwe V. Riss</i>                   | 1    |
| Part I: Philosophy of Computing and Information   |      |
| 1 The Fourth Revolution in our Self-Understanding – <i>Luciano Floridi</i>  | 19   |
| 2 Information Transfer as a Metaphor – <i>Jakob Krebs</i>   | 29   |
| 3 With Aristotle towards a Differentiated Concept of Information? – <i>Uwe Voigt</i>  | 41   |
| 4 The Influence of Philosophy on the Understanding of Computing and Information – <i>Klaus Fuchs-Kittowski</i>                        | 45   |
| Part II: Complexity and System Theory   |      |
| 5 The Emergence of Self-Conscious Systems: From Symbolic AI to Embodied Robotics – <i>Klaus Mainzer</i>                               | 57   |
| 6 Artificial Intelligence as a New Metaphysical Project – <i>Aziz F. Zambak</i>   | 67   |
| Part III: Ontology  |      |
| 7 The Relevance of Philosophical Ontology to Information and Computer Science – <i>Barry Smith</i>                                    | 75   |
| 8 Ontology, its Origins and its Meaning in Information Science – <i>Jens Kohne</i>  | 85   |
| 9 Smart Questions: Steps towards an Ontology of Questions and Answers – <i>Ludwig Jaskolla and Matthias Rugel</i>                     | 91   |
| Part IV: Knowledge Representation   |      |
| 10 Sophisticated Knowledge Representation and Reasoning Requires Philosophy – <i>Selmer Bringsjord, Micah Clark and Joshua Taylor</i> | 99   |
| 11 On Frames and Theory-Elements of Structuralism – <i>Holger Andreas</i>   | 121  |
| 12 Ontological Complexity and Human Culture – <i>David J. Saab and Frederico Fonseca</i>  | 131  |
| Part V: Action Theory   |      |
| 13 Knowledge and Action between Abstraction and Concretion – <i>Uwe V. Riss</i>   | 145  |

|  |     |
|--|-----|
| 14 Action-Directing Construction of Reality in Product Creation<br>Using Social Software: Employing Philosophy to Solve Real-World<br>Problems – <i>Kai Holzweißig and Jens Krüger</i> | 169 |
| 15 An Action-Theory-Based Treatment of Temporal Individuals<br>– <i>Tillmann Pross</i>   | 179 |
| 16 Four Rules for Classifying Social Entities – <i>Ludger Jansen</i>   | 189 |
| Part VI: Info-Computationalism   |     |
| 17 Info-Computationalism and Philosophical Aspects of Research in<br>Information Sciences – <i>Gordana Dodig-Crnkovic</i>  | 201 |
| 18 Pancomputationalism: Theory or Metaphor? – <i>Vincent C. Müller</i>   | 213 |
| Part VII: Ethics   |     |
| 19 The Importance of the Sources of Professional Obligations<br>– <i>Francis C. Dane</i>   | 223 |
| Notes  | 231 |
| Index  | 267 |