Contents

Part I Abduction, Problem Solving, and Practical Reasoning

Animal Abduction
From Mindless Organisms to Artifactual Mediators
Lorenzo Magnani .................................................. 3

Communicative Gestures Facilitate Problem Solving for Both Communicators and Recipients
Sandra C. Lozano, Barbara Tversky .................. 39

The Concept of Fallacy is Empty
A Resource-Bound Approach to Error
John Woods .......................................................... 69

Abductive Reasoning, Information, and Mechanical Systems
Maria Eunice Quilici Gonzalez, Mariana Claudia Broens and Fabricio Loffredo D’Ottaviano .................... 91

Automated Abduction in Scientific Discovery
Oliver Ray ............................................................. 103

Abduction, Medical Semeiotics and Semioethics
Individual and Social Symptomatology from a Semiotic Perspective
Susan Petrilli .......................................................... 117

Abduction and Modeling in Biosemiotics and Sociosemiotics
Augusto Ponzio .................................................... 131

Reason out Emergence from Cellular Automata Modeling
Leilei Qi, Huaxia Zhang ........................................ 147

Belief Ascription and De Re Communication
Yuan Ren ............................................................ 161
## Contents

### Part I Models, Mental Models, Representations, and Medical Reasoning

**Multiagent-Based Simulation in Biology**  
_A Critical Analysis_  
*Francesco Amigoni, Viola Schiaffonati*  
179

**Mathematics through Diagrams: Microscopes in Non-Standard and Smooth Analysis**  
*Riccardo Dossena, Lorenzo Magnani*  
193

---

### Part II Models, Mental Models, Representations, and Medical Reasoning

**Cognition, Environment and the Collapse of Civilizations**  
*Michael E. Gorman*  
217

**Cognitive Aspects of Tacit Knowledge and Cultural Diversity**  
*Riccardo Viale, Andrea Pozzali*  
229

**The Functional-Analogical Explanation in Chinese Science and Technology**  
_A Case Study of the Theory of Yin-Yang and Five Elements_  
*Huazia Zhang, Zhilin Zhang*  
245

**Model-Based Reasoning and Diagnosis in Traditional Chinese Medicine (TCM)**  
*Zhikang Wang*  
261

**Model-Based Reasoning in Cognitive Science**  
*Yi-dong Wei*  
273

**An Examination of Model-Based Reasoning in Science and Medicine in India**  
*Sundari Krishnamurthy*  
293

**Ontology, Artefacts, and Models of Reasoning**  
*Pasi Pohjola*  
315

**The Wondering Angels of the Fractal Art**  
*Viorel Guliciuc*  
333

---

### Part III Logical and Computational Aspects of Model-Based Reasoning

**Polynomizing: Logic Inference in Polynomial Format and the Legacy of Boole**  
*Walter Carnielli*  
349
Abductive Inference and Iterated Conditionals
Claudio Pizzi .......................................................... 365

Peircean Pragmatic Truth and da Costa’s Quasi-Truth
Itala M. Loffredo D’Ottaviano, Carlos Hifune ............... 383

Sliding Mode Motion Control Strategies
for Rigid Robot Manipulators
Antonella Ferrara, Lorenza Magnani ............................. 399

Model-Based Chemical Compound Formulation
Stefania Bandini, Alessandro Mosca and Matteo Palmonari .... 413

Model-Based Reasoning for Self-Repair
of Autonomous Mobile Robots
Michael Hofbaur, Johannes Kôb, Gerald Steinbauer
and Franz Wotawa ...................................................... 431

Application of Bayesian Inference
to Automatic Semantic Annotation of Videos
Fangshi Wang, De Xu, Hongli Xu, Wei Lu and Weixin Wu .... 447

An Algebraic Approach to Model-Based Diagnosis
Shangmin Luan, Lorenzo Magnani and Guozhong Dai ........ 467

CYBERNARD: A Computational Reconstruction
of Claude Bernard’s Scientific Discoveries
Jean-Gabriel Ganascia, Claude Debru ............................ 497

Do Computational Models of Reading Need
a Bit of Semantics?
Remo Job, Claudio Mulatti ............................................ 511
Model-Based Reasoning in Science, Technology, and Medicine
Magnani, L.; Li, P. (Eds.)
2007, XIII, 525 p., Hardcover
ISBN: 978-3-540-71985-4