

Tabla de Contenidos

Stuart, S. Dodig-Crnkovic, G. Computation, Information, Cognition. The Nexus and the Liminal. Introduction. (2007) 1

Part I: Information 1

Part II: Ontology 1

Part III: Bioinformation and Biosemantics 2

Part IV: Cognitive Science and Philosophy 2

Part V: Computational Linguistics 2

Part VI: Ethics and Education 2

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Of perennial concern to philosophy, physics, and now the cognitive sciences, are the notions of causation and causal relations; their importance is no less considerable in the domains of information and computation. "Intuitively there is conceptual connection between causation and transfer of information, because we can't get any information from a system without interacting causally with it ... Thus transfer of information is a causal process." [Johansson, this volume] Johansson addresses this concern by first establishing four, quite different, proposals: causation is (i) the transfer of a conserved quantity; (ii) analysed in terms of counterfactuals; (iii) explicable in terms of INUSconditions, that is, a cause can be an insufficient [I] but necessary [N] part of a condition which is itself unnecessary [U] but exclusively sufficient [S]; and (iv) something we humans – agents – can manipulate in, for example, the transfer of information which can be a cause of something else. Johansson's suggestion is that, in an attempt to understand this rather complicated notion of causality, we must drop the counterfactual approach – it leads us up a blind alley when we try to determine its truth-value – and unify the other three approaches to provide a robust concept of cause as it is used in ordinary language, and in the natural and social sciences.

Preface

Introduction

Part I: Information

1. Epistemology as Information Theory: From Leibniz to Ω , Gregory Chaitin
2. Information Logic, Luciano Floridi
3. Formalising Semantic Information: Lessons From Logical Pluralism, Patrick Allo
4. Getting Closer to Iconic Logic, Ahti-Veikko Pietarinen

5. Causation: A Synthesis of Three Approaches, Lars-Göran Johansson

1. An Oriental Approach to the Philosophy of Information, Gang Liu

Part II: Ontology

1. Ontology as the Core Discipline of Biomedical Informatics - Legacies of the Past and Recommendations for the Future Direction of Research, Werner Ceusters and Barry Smith
2. Functions and Prototypes, Katherine Munn
3. Knowledge in Action, Ruth Hagengruber and Uwe V. Riss
4. Towards a Programming Language Ontology, Raymond Turner and Amnon H. Eden

Part III: Bioinformation and Biosemantics

1. The Informational Architectures of Biological Complexity, Pedro C. Marijuán and Raquel del Moral
2. The Cybersemiotic Framework as a Means to Conceptualize the Difference between Computing and Semiosis, Søren Brier
3. Meaning and Self-Organisation in Cognitive Science, Arturo Carsetti

Part IV: Cognitive Science and Philosophy

1. A Neurophysiological Approach to Consciousness: Integrating Molecular, Cellular and System Level Information, Peter Århem
2. Does dynamical modelling explain time consciousness?, Paavo Pylkkänen
3. Complexity, Cognition, and Logical Depth, Pauli Brattico
4. Is Computationalism Trivial?, Marcin Miłkowski
5. On Facing Up to the Semantic Challenge, Otto Lappi

Part V: Computational Linguistics

1. Computational Linguistics as an Applied Science, Pius ten Hacken
2. Views of Text Meaning in Computational Linguistics: Past, Present, and Future, Graeme Hirst
3. Language Technological Models as Epistemic Artefacts: The Case of Constraint Grammar Parser, Tarja Knuuttila

Part VI: Ethics and Education

1. The Paradox of Autonomy: The Interaction Between Humans and Autonomous Cognitive Artifacts, Alexander Riegler
2. A Copernican Revolution in Ethics?, Terrell Bynum
3. Building Epistemological Infrastructures- Interventions At A Technical University, Lena Trojer
4. Computer Ethics in (Higher) Education, Philip Brey

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