

# FORMAL ONTOLOGY IN INFORMATION SYSTEMS

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# Formal Ontology In Information Systems Formal Ontology In Information Systems

**Achille C. Varzi, Laure Vieu**



## **Formal Ontology In Information Systems Formal Ontology In Information Systems:**

**Formal Ontology in Information Systems** Nicola Guarino, 1998 Research on ontology is becoming increasingly widespread in the computer science community While this term has been rather confined to the philosophical sphere in the past it is now gaining a specific role in areas such as Artificial Intelligence Computational Linguistics and Databases Its importance has been recognized in fields as diverse as knowledge engineering knowledge representation qualitative modeling language engineering database design information integration object oriented analysis information retrieval and extraction knowledge management and organization agent based systems design Current applications areas are disparate including enterprise integration natural language translation medicine mechanical engineering electronic commerce geographic information systems legal information systems and biological information systems Various workshops addressing the engineering aspects of ontology have been held in the recent years However ontology by its very nature ought to be a unifying discipline Insights in this field have potential impact on the whole area of information systems taking this term in its broadest sense as testified by the interest recently shown by international standards organizations In order to provide a solid general foundation for this work it is therefore important to focus on the common scientific principles and open problems arising from current tools methodologies and applications of ontology

### **Formal Ontology in Information Systems**

Nathalie Aussenac-Gilles, Torsten Hahmann, Antony Galton, 2024-01-15 FOIS is the flagship conference of the International Association for Ontology and its Applications a non profit organization which promotes interdisciplinary research and international collaboration at the intersection of philosophical ontology linguistics logic cognitive science and computer science This book presents the papers delivered at FOIS 2023 the 13th edition of the Formal Ontology in Information Systems conference The event was held as a sequentially hybrid event face to face in Sherbrooke Canada from 17 to 20 July 2023 and online from 18 to 20 September 2023 In total 62 articles from 19 different countries were submitted out of which 25 were accepted for inclusion in the conference and for publication corresponding to an acceptance rate of 40 percent The contributions are separated into the book's three sections 1 Foundational ontological issues 2 Methodological issues around the development alignment verification and use of ontologies and 3 Domain ontologies and ontology based applications In these sections ontological aspects from a wide variety of fields are covered primarily from various engineering domains including cybersecurity manufacturing petroleum engineering and robotics but also extending to the humanities social sciences medicine and dentistry A noticeable trend among the contributions in this edition of the conference is the recognition that improving the tools to analyze align and improve ontologies is of paramount importance in continuing to advance the field of formal ontology The book will be of interest to all formal and applied ontology researchers and to those who use formal ontologies and information systems as part of their work

### **Formal Ontology in Information Systems**

Boyan Brodaric, Fabian Neuhaus, 2020-11-15 FOIS is the flagship conference of the International Association for Ontology and

its Applications a non profit organization which promotes interdisciplinary research and international collaboration at the intersection of philosophical ontology linguistics logic cognitive science and computer science as well as in the applications of ontological analysis to conceptual modeling knowledge engineering knowledge management information systems development library and information science scientific research and semantic technologies in general This volume presents the 17 papers accepted for the 11th Formal Ontology in Information Systems conference FOIS 2020 These papers cover a broad range of topics and are organized into 5 groups Foundations is dedicated to the general ontological decisions providing a foundation for any ontology both from a philosophical perspective and with an emphasis on applications Social Entities is dedicated to the ontological analysis and formalization of various social entities including secrets legal theories decisions kinship and cultural heritage The papers in Intentionality and Embodiment analyze aspects of an agent s intentions beliefs and desires as well as the embodiment of functional relations The section on Parts and Wholes is dedicated to mereology as well as the mereological analysis of certain types of entities e g pluralities information entities and computer programs Lastly the papers in Methods are about ontology evaluation and use Altogether the papers reflect traditional FOIS themes with perhaps a greater emphasis on social and agent aspects and will be of interest to all those whose work involves ontology and its applications

*Formal Ontology in Information Systems* Stefano Borgo,2018-09-15 FOIS is the flagship conference of the International Association for Ontology and its Applications IAOA Its interdisciplinary research focus lies at the intersection of philosophical ontology linguistics logic cognitive science and computer science as well as in the applications of ontological analysis to conceptual modeling knowledge engineering knowledge management information systems development library and information science scientific research and semantic technologies in general This volume presents the proceedings of FOIS 2018 held in Cape Town South Africa from 19 21 September It was the 10th edition and 20th anniversary of the conference series The volume contains 19 papers grouped into 4 sections Foundations 7 papers Agents and Properties 4 papers Methods and Tools 4 papers and Applications 4 papers Regarding the applications of ontologies a broad spectrum of areas is covered including in particular biology and medicine IoT engineering and linguistics Formal Ontology in Information Systems Proceedings of the 10th International Conference FOIS 2018 will be of interest to researchers from all disciplines with an interest in formal ontology

*Formal Ontology in Information Systems* B. Bennett,C. Fellbaum,2006-10-26 Aims to provide a forum for genuine interdisciplinary exchange in the spirit of a unified effort towards solving the problems of ontology with an eye to both theoretical issues and concrete applications This book contains a range of areas all of which are important to the development of formal ontologies

**Formal Ontology in Information Systems** P. Garbacz,O. Kutz,2014-09-05 Formal Ontology in Information Systems FOIS is the flagship conference of the International Association for Ontology and its Applications IAOA Its interdisciplinary research focus lies at the intersection of philosophical ontology linguistics logic cognitive science and computer science as well as in the applications of ontological analysis to conceptual

modeling knowledge engineering knowledge management information systems development library and information science scientific research and semantic technologies in general As in previous years FOIS 2014 was a nexus of interdisciplinary research and communication The current proceedings is divided into four main sections dealing with foundations processes agency and dispositions methods and tools and applications The last of these covers a broad spectrum of areas including in particular biology and medicine engineering and economy For the first time in its history the conference hosted a special track an ontology competition the aim of which was to encourage authors to make their ontologies publicly available and to allow them to be evaluated according to a set of predetermined criteria Papers discussing these ontologies can also be found in this volume The book will be of interest to all those whose work involves the application of ontologies and who are looking for a current overview of developments in formal ontology

**Formal Ontology in Information Systems** M. Donnelly, G. Guizzardi, 2012-07-13 The complex information systems which have evolved in recent decades rely on robust and coherent representations in order to function Such representations and associated reasoning techniques constitute the modern discipline of formal ontology which is now applied to fields such as artificial intelligence computational linguistics bioinformatics GIS conceptual modeling knowledge engineering information retrieval and the semantic web Ontologies are increasingly employed in a number of complex real world application domains For instance in biology and medicine more and more principle based ontologies are being developed for the description of biological and biomedical phenomena To be effective such ontologies must work well together and as they become more widely used achieving coordinated development presents a significant challenge This book presents collected articles from the 7th International Conference on Formal Ontologies FOIS held in Graz Austria in July 2012 FOIS is a forum which brings together representatives of all major communities involved in the development and application of ontologies to explore both theoretical issues and concrete applications in the field The book is organized in eight sections each of which deals with the ontological aspects of bioinformatics physical entities artifacts and human resources ontology evaluation language and social relations time and events representation and the methodological aspects of ontological engineering Providing a current overview of developments in formal ontology this book will be of interest to all those whose work involves the application of ontologies and to anybody wishing to keep abreast of advances in the field

Formal Ontology in Information Systems Antony Galton, Riichiro Mizoguchi, 2010 Ontology began life in ancient times as a fundamental part of philosophical enquiry concerned with the analysis and categorisation of what exists In recent years the subject has taken a practical turn with the advent of complex computerised information systems which are reliant on robust and coherent representations of their subject matter The systematisation and elaboration of such representations and their associated reasoning techniques constitute the modern discipline of formal ontology which is now being applied to such diverse domains as artificial intelligence computational linguistics bioinformatics GIS knowledge engineering information retrieval and the Semantic Web

Researchers in all these areas are becoming increasingly aware of the need for serious engagement with ontology understood as a general theory of the types of entities and relations making up their respective domains of enquiry to provide a solid foundation for their work. The conference series Formal Ontology in Information Systems FOIS provides a meeting point for researchers from these and other disciplines with an interest in formal ontology where both theoretical issues and concrete applications can be explored in a spirit of genuine interdisciplinarity. This volume contains the proceedings of the sixth FOIS conference held in Toronto Canada during 11-14 May 2010 including invited talks by Francis Jeffry Pelletier, John Bateman and Alan Rector and the 28 peer-reviewed submissions selected for presentation at the conference ranging from foundational issues to more application-oriented topics. IOS Press is an international science, technical and medical publisher of high quality books for academics, scientists and professionals in all fields. Some of the areas we publish in: Biomedicine, Oncology, Artificial intelligence, Databases and information systems, Maritime engineering, Nanotechnology, Geoengineering. All aspects of physics, E-governance, E-commerce, The knowledge economy, Urban studies, Arms control, Understanding and responding to terrorism, Medical informatics, Computer Sciences.

**Formal Ontology in Information Systems**, 2006. Aims to provide a forum for genuine interdisciplinary exchange in the spirit of a unified effort towards solving the problems of ontology with an eye to both theoretical issues and concrete applications. This book contains a range of areas all of which are important to the development of formal ontologies.

**Formal Ontology in Information Systems**, Fabian Neuhaus, Boyan Brodaric, 2022-01-15. Formal Ontology in Information Systems FOIS is the flagship conference of the International Association for Ontology and its Applications, a non-profit organization promoting interdisciplinary research and international collaboration at the intersection of philosophical ontology, linguistics, logic, cognitive science and computer science. This book presents the 11 papers accepted for the 12th edition of FOIS. The conference was held from 13-17 September 2021 in Bozen Bolzano, Italy, as a hybrid event with some participants attending on site in Bolzano and others attending virtually online. The papers are divided into 3 sections and cover a wide range of topics: 1. Foundations addressing fundamental issues; 2. Applications and Methods presenting novel uses, systems, tools and approaches; and 3. Domain Ontology describing well-formed ontologies in particular subject areas.

**Formal Ontology in Information Systems**, Roberta Ferrario, Werner Kuhn, 2016-07-06. Ontology, originally a fundamental part of philosophical enquiry, is concerned with the analysis and categorization of what exists. The advent of complex information systems which rely on robust and coherent formal representations of their subject matter has led to a renewed focus on ontological enquiry and the systematic study of such representations are at the center of the modern discipline of formal ontology. This is now a research focus in domains as diverse as conceptual modeling, database design, software engineering, artificial intelligence, computational linguistics, the life sciences, bioinformatics, geographic information science, knowledge engineering, information retrieval and the semantic web. This book presents the proceedings of the 9th edition of the Formal Ontology in Information Systems conference FOIS 2016.

held in Annecy France in July 2016 It contains the 25 full papers delivered at the conference an acceptance rate of 30.9% for the main track as well as the abstracts of the 3 keynotes by Gilberto C. Marra, Stephen Mumford and Friederike Moltmann The remainder of the book is divided into the sections Foundations, Space, Time and Change, Cognition, Language and Semantics, Empiricism and Measurement, Ontology for Engineering, Biomedical Ontologies and Ontology of Social Reality The domains addressed by the papers include geography, biomedicine, economics, social reality and engineering and the book will be of interest to all those working in these fields as well as to anybody with an interest in formal ontology

*Formal Ontology in Information Systems* Carola Eschenbach, Michael Gruninger, 2008 Since its start ten years ago the International Conference in Formal Ontology on Information Systems FOIS has explored the multiple perspectives on the notion of ontology that have arisen from such diverse research communities as philosophy, logic, computer science, cognitive science, linguistics and various scientific domains As ontologies have been applied in new and exciting domains such as the World Wide Web, bioinformatics and geographical information systems it has become evident that there is a need for ontologies that have been developed with solid theoretical foundations based on philosophical, linguistic and logical analysis Similarly there is also a need for theoretical research that is driven by the issues that have been raised by recent work in the more applied domains FOIS is intended to be a forum in which to explore this interplay between the theoretical insights of formal ontology and their application to information systems and emerging semantic technologies Themes emerging from this volume give a snapshot of current issues within the fields of formal ontology and ontological engineering as well providing a glimpse of future research directions

**Book Jacket** **Formal Ontology in Information Systems** Achille C. Varzi, Laure Vieu, 2004 Just as ontology developed over the centuries as part of philosophy so in recent years ontology has become intertwined with the development of the information sciences Researchers in such areas as artificial intelligence, formal and computational linguistics, biomedical informatics, conceptual modeling, knowledge engineering and information retrieval have come to realize that a solid foundation for their research calls for serious work in ontology understood as a general theory of the types of entities and relations that make up their respective domains of inquiry In all these areas attention has started to focus on the content of information rather than on just the formats and languages in terms of which information is represented A clear example of this development is provided by the many initiatives growing up around the project of the Semantic Web And as the need for integrating research in these different fields arises so does the realization that strong principles for building well founded ontologies might provide significant advantages over ad hoc case based solutions The tools of Formal Ontology address precisely these needs but a real effort is required in order to apply such philosophical tools to the domain of Information Systems Reciprocally research in the information science raises specific ontological questions which call for further philosophical investigations

**Proceedings of the International Conference on Formal Ontology in Information Systems - Volume 2001** Nicola Guarino, 2001 *Formal Ontology in Information Systems* Achille C.

Varzi, Laure Vieu, 2004 Just as ontology developed over the centuries as part of philosophy so in recent years ontology has become intertwined with the development of the information sciences Researchers in such areas as artificial intelligence formal and computational linguistics biomedical informatics conceptual modeling knowledge engineering and information retrieval have come to realize that a solid foundation for their research calls for serious work in ontology understood as a general theory of the types of entities and relations that make up their respective domains of inquiry In all these areas attention has started to focus on the content of information rather than on just the formats and languages in terms of which information is represented A clear example of this development is provided by the many initiatives growing up around the project of the Semantic Web And as the need for integrating research in these different fields arises so does the realization that strong principles for building well founded ontologies might provide significant advantages over ad hoc case based solutions The tools of Formal Ontology address precisely these needs but a real effort is required in order to apply such philosophical tools to the domain of Information Systems Reciprocally research in the information science raises specific ontological questions which call for further philosophical investigations

**FOIS ACM, Formal Ontology in Information Systems** Nicola Guarino, 2001

**The SAGE Handbook of GIS and Society** Timothy Nyerges, Helen Couclelis, Robert McMaster, 2011-05-09 The definitive guide to a technology that succeeds or fails depending upon our ability to accommodate societal context and structures This handbook is lucid integrative comprehensive and above all prescient in its interpretation of GIS implementation as a societal process Paul Longley University College London This is truly a handbook a book you will want to keep on hand for frequent reference and to which GIS professors should direct students entering our field Selection of a few of the chapters for individual attention is difficult because each one contributes meaningfully to the overall message of this volume An important collection of articles that will set the tone for the next two decades of discourse and research about GIS and society Journal of Geographical Analysis Over the past twenty years research on the evolving relationship between GIS and Society has been expanding into a wide variety of topical areas becoming in the process an increasingly challenging and multifaceted endeavour The SAGE Handbook of GIS and Society is a retrospective and prospective overview of GIS and Society research that provides an expansive and critical assessment of work in that field Emphasizing the theoretical methodological and substantive diversity within GIS and Society research the book highlights the distinctiveness and intellectual coherence of the subject as a field of study while also examining its resonances with and between key themes and among disciplines ranging from geography and computer science to sociology anthropology and the health and environmental sciences Comprising 27 chapters often with an international focus the book is organized into six sections Foundations of Geographic Information and Society Geographical Information and Modern Life Alternative Representations of Geographic Information and Society Organizations and Institutions Participation and Community Issues Value Fairness and Privacy Aimed at academics researchers postgraduates and GIS practitioners this



Handbook will be the basic reference for any inquiry applying GIS to societal issues Holonic and Multi-Agent Systems for Manufacturing Vladimir Marik,Duncan McFarlane,Paul Valckenaers,2004-01-24 The increasing complexity of manufacturing systems as well as the overall demands for flexible and fault tolerant control of production processes stimulates among many others two key emerging technologies that are already making an important breakthrough in the field of intelligent manufacturing control and diagnostics These two paradigms are the holonic approach based on the event driven control strategy usually aimed at modular control systems that are directly physically linked with the manufacturing hardware equipment and the multi agent approach developed in the area of distributed information processing The research communities working in both these fields are approaching the problem of intelligent manufacturing from different viewpoints and until recently to a certain extent in an independent way We can however observe quite a clear convergence of these fields in the last few years the communities have started to cooperate joining efforts to solve the painful problems involved in achieving effective industrial practice We can see convergence in the terminology standards and methods being applied

**Building Ontologies with Basic Formal Ontology** Robert Arp,Barry Smith,Andrew D. Spear,2015-07-31 An introduction to the field of applied ontology with examples derived particularly from biomedicine covering theoretical components design practices and practical applications In the era of big data science is increasingly information driven and the potential for computers to store manage and integrate massive amounts of data has given rise to such new disciplinary fields as biomedical informatics Applied ontology offers a strategy for the organization of scientific information in computer tractable form drawing on concepts not only from computer and information science but also from linguistics logic and philosophy This book provides an introduction to the field of applied ontology that is of particular relevance to biomedicine covering theoretical components of ontologies best practices for ontology design and examples of biomedical ontologies in use After defining an ontology as a representation of the types of entities in a given domain the book distinguishes between different kinds of ontologies and taxonomies and shows how applied ontology draws on more traditional ideas from metaphysics It presents the core features of the Basic Formal Ontology BFO now used by over one hundred ontology projects around the world and offers examples of domain ontologies that utilize BFO The book also describes Web Ontology Language OWL a common framework for Semantic Web technologies Throughout the book provides concrete recommendations for the design and construction of domain ontologies

## Decoding **Formal Ontology In Information Systems Formal Ontology In Information Systems**: Revealing the Captivating Potential of Verbal Expression

In a time characterized by interconnectedness and an insatiable thirst for knowledge, the captivating potential of verbal expression has emerged as a formidable force. Its power to evoke sentiments, stimulate introspection, and incite profound transformations is genuinely awe-inspiring. Within the pages of "**Formal Ontology In Information Systems Formal Ontology In Information Systems**," a mesmerizing literary creation penned by a celebrated wordsmith, readers embark on an enlightening odyssey, unraveling the intricate significance of language and its enduring impact on our lives. In this appraisal, we shall explore the book's central themes, evaluate its distinctive writing style, and gauge its pervasive influence on the hearts and minds of its readership.

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