Computational Semantics With Functional Programmin

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Logic in High Definition Alessandro Giordani 2020-11-19 This volume clusters together issues centered upon the variety of types of intensional semantics. Consisting of 10 contributions, the volume is based on papers presented at the Trends in Logic 2019 conference. The various chapters introduce readers to the topic, or apply new types of logical semantics to elucidate subtleties of logical systems and natural language semantics. The book introduces hyperintentional systems that aim at solving some open philosophical problems. Specifically, the first three studies focus on relating semantics, while the following ones discuss fundamental issues related to hyper-intensional semantics or develop hyper-intensional frameworks to address issues in modal, epistemic, deontic and action logic. Authors in this volume present original results on logical systems but also extend beyond this by offering philosophical considerations on the topic as well. This volume will appeal to students and researchers in the field of logic.

Types for Proofs and Programs Ralph Matthes 2014-07-31 In this LIPIcs proceedings one can find research papers on the following topics: analysis of the classical principles in intuitionistic calculi, type isomorphisms for intersection types, monads and their semantics in functional programming languages, realizability, extensions of type theory, extensions of linear logic, models of type theory, control operators in type systems, formal verification of programs, program extraction, compiler formalization and modelling of natural language features. All papers obtained at least two reviews, and up to six reviews, counting a second round of review.

Proceedings of the Sixth ACM SIGPLAN International Conference on Functional Programming (ICFP '01), Florence, Italy, September 3-5, 2001 2001

Mathematical Aspects of Logic Programming Semantics Pascal Hitzler 2016-04-19

Covering the authors' own state-of-the-art research results, this book presents a rigorous, modern account of the mathematical methods and tools required for the semantic analysis of logic programs. It significantly extends the tools and methods from traditional order theory to include nonconventional methods from mathematical analysis that depend on topology, domain theory, generalized distance functions, and associated fixed-point theory. The authors closely examine the interrelationships between various semantics as well as the integration of logic programming and connectionist systems/neural networks.

Functional Programming and Input/Output Andrew D. Gordon 1994-10-13 Extends functional programming to solve I/O problems, while retaining usual verification features.

Elements of Formal Semantics Yoad Winter 2016-04-08 Introducing some of the foundational concepts, principles and techniques in the formal semantics of natural language, Elements of Formal Semantics outlines the mathematical principles that underlie linguistic meaning. Making use of a wide range of concrete English examples, the book presents the most useful tools and concepts of formal semantics in an accessible style and includes a variety of practical exercises so that readers can learn to utilise these tools effectively. For readers with an elementary background in set theory and linguistics or with an interest in mathematical modelling, this fascinating study is an ideal introduction to natural language semantics. Designed as a quick yet thorough introduction to one of the most vibrant areas of research in modern linguistics today this volume reveals the beauty and elegance of the mathematical study of meaning.

Computational Intelligence and Its Applications in Healthcare Jitendra Kumar Verma 2020-08-01 Computational Intelligence and Its Applications in Healthcare presents rapidly growing applications of computational intelligence for healthcare systems, including intelligent synthetic characters, man-machine interface, menu generators, user acceptance analysis, pictures archiving, and communication systems. Computational intelligence is the study of the design of intelligent agents, which are systems that act intelligently: they do what they think are appropriate for their circumstances and goals; they're flexible to changing environments and goals; they learn from experience; and they make appropriate choices given perceptual limitations and finite computation. Computational intelligence paradigms offer many advantages in maintaining and enhancing the field of healthcare. Provides coverage of fuzzy logic, neural networks, evolutionary computation, learning theory, probabilistic methods, telemedicine, and robotics applications Includes coverage of artificial intelligence and biological applications, soft computing, image and signal processing, and genetic algorithms Presents the latest developments in computational methods in healthcare Bridges the gap between obsolete literature and current literature

Computational Semantics with Functional Programming Jan van Eijck 2010-09-23 Computational semantics is the art and science of computing meaning in natural

language. The meaning of a sentence is derived from the meanings of the individual words in it, and this process can be made so precise that it can be implemented on a computer. Designed for students of linguistics, computer science, logic and philosophy, this comprehensive text shows how to compute meaning using the functional programming language Haskell. It deals with both denotational meaning (where meaning comes from knowing the conditions of truth in situations), and operational meaning (where meaning is an instruction for performing cognitive action). Including a discussion of recent developments in logic, it will be invaluable to linguistics students wanting to apply logic to their studies, logic students wishing to learn how their subject can be applied to linguistics, and functional programmers interested in natural language processing as a new application area.

Logical Aspects of Computational Linguistics. Celebrating 20 Years of LACL (1996–2016) Maxime Amblard 2016-11-21 Edited under the auspices of the Association of Logic, Language andInformation (FoLLI), this book constitutes the refereed proceedings ofthe 20th anniversary of the International Conference on LogicalAspects of Computational Linguistics, LACL 2016, held in LORIA Nancy,France, in December 2016. The 19 contributed papers, presentedtogether with 4 invited papers and 6 abstracts, were carefullyreviewed and selected from 38 submissions. The focus of the conferenceis the use of type theoretic, proof theoretic, and model theoreticmethods for describing and formalising natural language syntax,semantics, and pragmatics as well as the implementation of thecorresponding tools.

Web Information Systems and Technologies Alessandro Bozzon 2020-11-02 This book constitutes revised selected papers from the 15th International Conference on Web Information Systems and Technologies, WEBIST 20109 held in Vienna, Austria, in September 2019. The 10 full papers presented in this volume were carefully reviewed and selected from originally 87 paper submissions. They contribute to the understanding of relevant trends of current research on Web Information Systems and Technologies, including Big Data and Connected Services; Web Performance; Context-aware and Adaptive Web Applications; Human Robot Collaboration and Multi-Agent Systems; Web Application Operating Systems and Platforms; Social Media Advertising and Enhancing Purchase Intentions; Natural Language Query Interfaces and Semantic Web; and Human-computer Interaction and Dynamic Web Pages.

Enriched Meanings Ash Asudeh 2020-09-15 This book develops a theory of enriched meanings for natural language interpretation that uses the concept of monads and related ideas from category theory. The volume is interdisciplinary in nature, and will appeal to graduate students and researchers from a range of disciplines interested in natural language understanding and representation.

Formal Grammar Glyn Morrill 2014-07-10 This book constitutes the refereed proceedings of the 19 International Conference on Formal Grammar 2014, collocated with the European Summer School in Logic, Language and Information in August 2014. The 10 revised full papers presented together with 2 invited

contributions were carefully reviewed and selected from a total of 19 submissions. Traditionally linguistics has been studied from the point of view of the arts, humanities and letters, but in order to make concrete ideas which might otherwise be fanciful the study of grammar has been increasingly subject to the rigours of computer science and mathematization i.e. articulation in the language of science.

Semantics and Logics of Computation Andrew M. Pitts 1997-01-30 Summer school lecture courses on modern logic and computation are presented here.

Computational Linguistics and Formal Semantics Michael Rosner 1992-10-30 This 1992 collection explores the syntax/semantics interface, introducing the disciplines of computational linguistics and formal semantics.

An Introduction to Functional Programming Through Lambda Calculus Greg Michaelson 2013-04-10 Well-respected text for computer science students provides an accessible introduction to functional programming. Cogent examples illuminate the central ideas, and numerous exercises offer reinforcement. Includes solutions. 1989 edition.

Handbook of Logic and Language Johan F.A.K. van Benthem 2010-12-17 The logical study of language is becoming more interdisciplinary, playing a role in fields such as computer science, artificial intelligence, cognitive science and game theory. This new edition, written by the leading experts in the field, presents an overview of the latest developments at the interface of logic and linguistics as well as a historical perspective. It is divided into three parts covering Frameworks, General Topics and Descriptive Themes. Completely revised and updated - includes over 25% new material Discusses the interface between logic and language Many of the authors are creators or active developers of the theories

Linguistic Expressions and Semantic Processing Alastair Butler 2015-05-26 This book introduces formal semantics techniques for a natural language processing audience. Methods discussed involve: (i) the denotational techniques used in model-theoretic semantics, which make it possible to determine whether a linguistic expression is true or false with respect to some model of the way things happen to be; and (ii) stages of interpretation, i.e., ways to arrive at meanings by evaluating and converting source linguistic expressions, possibly with respect to contexts, into output (logical) forms that could be used with (i). The book demonstrates that the methods allow wide coverage without compromising the quality of semantic analysis. Access to unrestricted, robust and accurate semantic analysis is widely regarded as an essential component for improving natural language processing tasks, such as: recognizing textual entailment, information extraction, summarization, automatic reply, and machine translation.

The Handbook of Computational Linguistics and Natural Language Processing Alexander Clark 2013-04-24 This comprehensive reference work provides an

overview of the concepts, methodologies, and applications in computational linguistics and natural language processing (NLP). Features contributions by the top researchers in the field, reflecting the work that is driving the discipline forward Includes an introduction to the major theoretical issues in these fields, as well as the central engineering applications that the work has produced Presents the major developments in an accessible way, explaining the close connection between scientific understanding of the computational properties of natural language and the creation of effective language technologies Serves as an invaluable state-of-the-art reference source for computational linguists and software engineers developing NLP applications in industrial research and development labs of software companies

Proceedings of the Fifth ACM SIGPLAN International Conference on Functional Programming (ICFP '00), Montréal, Canada, September 18-21, 2000 2000

Programming Language Foundations Aaron Stump 2013-09-23 Stump’s Programming Language Foundations is a short concise text that covers semantics, equally weighting operational and denotational semantics for several different programming paradigms: imperative, concurrent, and functional. Programming Language Foundations provides: an even coverage of denotational, operational an axiomatic semantics; extensions to concurrent and non-deterministic versions; operational semantics for untyped lambda calculus; functional programming; type systems; and coverage of emerging topics and modern research directions.

Computational Semantics with Functional Programming Jan van Eijck 2010-09-23 Computational semantics is the art and science of computing meaning in natural language. The meaning of a sentence is derived from the meanings of the individual words in it, and this process can be made so precise that it can be implemented on a computer. Designed for students of linguistics, computer science, logic and philosophy, this comprehensive text shows how to compute meaning using the functional programming language Haskell. It deals with both denotational meaning (where meaning comes from knowing the conditions of truth in situations), and operational meaning (where meaning is an instruction for performing cognitive action). Including a discussion of recent developments in logic, it will be invaluable to linguistics students wanting to apply logic to their studies, logic students wishing to learn how their subject can be applied to linguistics, and functional programmers interested in natural language processing as a new application area.

Ontological Semantics Sergei Nirenburg 2004 'Ontological Semantics' introduces a comprehensive approach to the treatment of text meaning by computer, arguing that being able to use meaning is crucial to the success of natural language processing applications.

Context and Coherence Una Stojnić 2021-02-25 Natural languages are riddled with context-sensitivity, yet how do we understand one another so effortlessly? Contrary to the dominant position, this book argues that meaning is determined entirely by discourse conventions, as we draw on a broad array of subtle

linguistic conventions that determine the interpretation of context-sensitive items.

Python for Linguists Michael Hammond 2020-05-07 An introduction to Python programming for linguists. Examples of code specifically designed for language analysis are featured throughout.

Categorical Combinators, Sequential Algorithms, and Functional Programming P.-L. Curien 2012-12-06 This book is a revised edition of the monograph which appeared under the same title in the series Research Notes in Theoretical Computer Science, Pit man, in 1986. In addition to a general effort to improve typography, English, and presentation, the main novelty of this second edition is the integration of some new material. Part of it is mine (mostly jointly with coauthors). Here is brief guide to these additions. I have augmented the account of categorical combinatory logic with a description of the confluence properties of rewriting systems of categor ical combinators (Hardin, Yokouchi), and of the newly developed cal culi of explicit substitutions (Abadi, Cardelli, Curien, Hardin, Levy, and Rios), which are similar in spirit to the categorical combinatory logic, but are closer to the syntax of A-calculus (Section 1.2). The study of the full abstraction problem for PCF and extensions of it has been enriched with a new full abstraction result: the model of sequential algorithms is fully abstract with respect to an extension of PCF with a control operator (Cartwright, Felleisen, Curien). An order extensional model of error-sensitive sequential algorithms is also fully abstract for a corresponding extension of PCF with a control operator and errors (Sections 2.6 and 4.1). I suggest that sequential algorithms lend themselves to a decomposition of the function spaces that leads to models of linear logic (Lamarche, Curien), and that connects sequentiality with games (Joyal, Blass, Abramsky) (Sections 2.1 and 2.6).

Continuations and Natural Language Chris Barker 2014-11-27 This book takes concepts developed by researchers in theoretical computer science and adapts and applies them to the study of natural language meaning. Summarizing more than a decade of research, Chris Barker and Chung-chieh Shan put forward the Continuation Hypothesis: that the meaning of a natural language expression can depend on its own continuation. In Part I, the authors develop a continuation-based theory of scope and quantificational binding and provide an explanation for order sensitivity in scope-related phenomena such as scope ambiguity, crossover, superiority, reconstruction, negative polarity licensing, dynamic anaphora, and donkey anaphora. Part II outlines an innovative substructural logic for reasoning about continuations and proposes an analysis of the compositional semantics of adjectives such as 'same' in terms of parasitic and recursive scope. It also shows that certain cases of ellipsis should be treated as anaphora to a continuation, leading to a new explanation for a subtype of sluicing known as sprouting. The book makes a significant contribution to work on scope, reference, quantification, and other central aspects of semantics and will appeal to semanticists in linguistics and philosophy at graduate level and above.

Introducing Speech and Language Processing John Coleman 2005-03-03 Provides a clearly-written, concise and accessible introduction to speech and language processing, with accompanying software.

Applied Semantics Gilles Barthe 2003-08-02 This book is based on material presented at the international summer school on Applied Semantics that took place in Caminha, Portugal, in September 2000. We aim to present some recent developments in programming language research, both in semantic theory and in implementation, in a series of graduate-level lectures. The school was sponsored by the ESPRIT Working Group 26142 on Applied Semantics(APPSEM),whichoperatedbetweenApril1998andMarch2002.The purpose of this working group was to bring together leading reseachers, both in semantic theory and in implementation, with the speci?c aim of improving the communication between theoreticians and practitioners. TheactivitiesofAPPSEMwerestructuredintonineinterdisciplinarythemes: A: Semantics for object-oriented programming B: Program structuring C: Integration of functional languages and proof assistants D: Veri?cation methods E: Automatic program transformation F: Games, sequentiality, and abstract machines G: Types and type inference in programming H: Semantics-based optimization I: Domain theory and real number computation These themes were identi?ed as promising for pro?table interaction between semantic theory and practice, and were chosen to contribute to the following general topics: – description of existing programming language features; – design of new programming language features; – implementation and analysis of programming languages; – transformation and generation of programs; – veri?cation of programs. The chapters in this volume give examples of recent developments covering a broad range of topics of interest to APPSEM.

The Handbook of Contemporary Semantic Theory Shalom Lappin 2019-02-12 The second edition of The Handbook of Contemporary Semantic Theory presents a comprehensive introduction to cutting-edge research in contemporary theoretical and computational semantics. Features completely new content from the first edition of The Handbook of Contemporary Semantic Theory Features contributions by leading semanticists, who introduce core areas of contemporary semantic research, while discussing current research Suitable for graduate students for courses in semantic theory and for advanced researchers as an introduction to current theoretical work

Semantics of Programming Languages Carl A. Gunter 1992 Semantics of Programming Languages exposes the basic motivations and philosophy underlying the applications of semantic techniques in computer science. It introduces the mathematical theory of programming languages with an emphasis on higher-order functions and type systems. Designed as a text for upper-level and graduate-level students, the mathematically sophisticated approach will also prove useful to professionals who want an easily referenced description of fundamental results and calculi. Basic connections between computational behavior, denotational semantics, and the equational logic of functional programs are thoroughly and rigorously developed. Topics covered include models

of types, operational semantics, category theory, domain theory, fixed point (denotational). semantics, full abstraction and other semantic correspondence criteria, types and evaluation, type checking and inference, parametric polymorphism, and subtyping. All topics are treated clearly and in depth, with complete proofs for the major results and numerous exercises.

Trends in Functional Programming Viktória Zsók 2021-08-23 This book constitutes revised selected papers from the 22nd International Symposium on Trends in Functional Programming, TFP 2021, which was held virtually in February 2020. The 6 full papers presented in this volume were carefully reviewed and selected from 18 submissions. They were organized in topical sections about nested parallelism, semantics, task-oriented programming and modelling, translating, proving functional programs. Chapter 'Dataset Sensitive Autotuning of Multi-Versioned Code based on Monotonic Properties' is available open access under a Creative Commons Attribution 4.0 International License via link.springer.com. Chapter 'High-level Modelling for Typed Functional Programming' is available open access under a Creative Commons Attribution 4.0 International License via link.springer.com.

Digital Human Modeling and Applications in Health, Safety, Ergonomics and Risk Management. Human Body, Motion and Behavior Vincent G. Duffy 2021-07-03 This two-volume set LNCS 12777 and 12778 constitutes the thoroughly refereed proceedings of the 12th International Conference on Digital Human Modeling and Applications in Health, Safety, Ergonomics and Risk Management, DHM 2021, which was held virtually as part of the 23rd HCI International Conference, HCII 2021, in July 2021. The total of 1276 papers and 241 posters included in the 39 HCII 2021 proceedings volumes was carefully reviewed and selected from 5222 submissions. DHM 2021 includes a total of 56 papers; they were organized in topical sections named: Part I, Human Body, Motion and Behavior: Ergonomics, human factors and occupational health; human body and motion modeling; and language, communication and behavior modeling. Part II, AI, Product and Service: Rethinking healthcare; artificial intelligence applications and ethical issues; and digital human modeling in product and service design.

New Frontiers in Artificial Intelligence Tsuyoshi Murata 2015-08-24 This book constitutes the thoroughly refereed post-conference proceedings of the JSAI-isAI 2014 Workshops LENLS, JURISIN, and GABA which took place on November 2014, in Japan. The 26 contributions in this volume were carefully reviewed and selected from 57 submissionsfrom the 3 workshops (LENLS11, JURISIN2014, and GABA2014). LENLS (Logic and Engineering of Natural Language Semantics) is an annual international workshop on formal semantics and pragmatics and it focused on the formal and theoretical aspects of natural language. JURISIN (Juris-informatics) 2014 was the 8th event in the series, the purpose of this workshop was to discuss fundamental and practical issues for juris-informatics, bringing together experts from a variety of relevant backgrounds, including law, social science, information and intelligent technology, logic and philosophy (including the area of AI and law). GABA (Graph-based Algorithms for Big Data and its Applications) 2014 was the first workshop on graph structures including

string, tree, bipartite- and di-graph for knowledge discovery in big data. The purpose of this workshop was to discuss ideas for realizing big data integration, including algorithms with theoretical / experimental results.

The Semantic Representation of Natural Language Michael Levison 2013-05-23 Proposes robust onomasiological semantic formalism and applies it to a wide variety of linguistic phenomena.

The Formal Semantics of Programming Languages Glynn Winskel 1993-02-05 The Formal Semantics of Programming Languages provides the basic mathematical techniques necessary for those who are beginning a study of the semantics and logics of programming languages. These techniques will allow students to invent, formalize, and justify rules with which to reason about a variety of programming languages. Although the treatment is elementary, several of the topics covered are drawn from recent research, including the vital area of concurency. The book contains many exercises ranging from simple to miniprojects.Starting with basic set theory, structural operational semantics is introduced as a way to define the meaning of programming languages along with associated proof techniques. Denotational and axiomatic semantics are illustrated on a simple language of while-programs, and fall proofs are given of the equivalence of the operational and denotational semantics and soundness and relative completeness of the axiomatic semantics. A proof of Godel's incompleteness theorem, which emphasizes the impossibility of achieving a fully complete axiomatic semantics, is included. It is supported by an appendix providing an introduction to the theory of computability based on while-programs. Following a presentation of domain theory, the semantics and methods of proof for several functional languages are treated. The simplest language is that of recursion equations with both call-by-value and call-by-name evaluation. This work is extended to lan guages with higher and recursive types, including a treatment of the eager and lazy lambda-calculi. Throughout, the relationship between denotational and operational semantics is stressed, and the proofs of the correspondence between the operation and denotational semantics are provided. The treatment of recursive types - one of the more advanced parts of the book - relies on the use of information systems to represent domains. The book concludes with a chapter on parallel programming languages, accompanied by a discussion of methods for specifying and verifying nondeterministic and parallel programs.

Semantic Techniques in Quantum Computation Simon Gay 2010 Explores quantum computation from the perspective of the branch of theoretical computer science known as semantics.

Declarative Programming, Sasbachwalden 1991 John Darlington 2013-12-21 Declarative programming languages are based on sound mathematical foundations which means that they offer many advantages for software development. These advantages include their powerful descriptive capabilities, the availability of program analysis techniques and the potential for parallel execution. This volume contains the proceedings of a seminar and workshop organised by the

Esprit Basic Research Action Phoenix in collaboration with the Esprit Basic Research Action Integration. Both these groups have been closely involved in investigating the foundations of declarative programming and the integration of various language paradigms, as well as the developing aspects of related technology. The main aim of the seminar and workshop was to provide a forum for the results of this work, together with contributions from other researchers in the same field. These papers cover a variety of important technical areas such as foundations and languages, program transformation and analysis, integrated approaches, implementation techniques, abstract machines and programming methodology. The resulting volume provides an in-depth picture of current research into declarative programming. It will be of special interest to researchers in programming languages and methodology, students of artificial intelligence and anyone involved in industrial research and development.

Logic, Language, Information, and Computation Rosalie Iemhoff 2019-06-23 Edited in collaboration with FoLLI, the Association of Logic, Language and Information this book constitutes the refereed proceedings of the 26th Workshop on Logic, Language, Information and Communication, WoLLIC 2019, held in Utrecht, The Netherlands, in July 2019. The 41 full papers together with 6 invited lectures presented were fully reviewed and selected from 60 submissions. The idea is to have a forum which is large enough in the number of possible interactions between logic and the sciences related to information and computation, and yet is small enough to allow for concrete and useful interaction among participants.

Proceedings of the 2002 ACM SIGPLAN International Conference on Functional Programming (ICFP '02) 2002

Computational Semantics with Functional Programming Jan van Eijck 2010-09-23 Computational semantics is the art and science of computing meaning in natural language. The meaning of a sentence is derived from the meanings of the individual words in it, and this process can be made so precise that it can be implemented on a computer. Designed for students of linguistics, computer science, logic and philosophy, this comprehensive text shows how to compute meaning using the functional programming language Haskell. It deals with both denotational meaning (where meaning comes from knowing the conditions of truth in situations), and operational meaning (where meaning is an instruction for performing cognitive action). Including a discussion of recent developments in logic, it will be invaluable to linguistics students wanting to apply logic to their studies, logic students wishing to learn how their subject can be applied to linguistics, and functional programmers interested in natural language processing as a new application area.