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Semantics with Applications: An Appetizer

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Programming Languages and Operational Semantics Springer Science & Business Media

This accessible and engaging textbook presents a concise introduction to the exciting field of artificial intelligence (AI). The broad-ranging discussion covers the key subdisciplines within the field, describing practical algorithms and concrete applications in the areas of agents, logic, search, reasoning under uncertainty, machine learning, neural networks, and reinforcement learning. Fully revised and updated, this much-anticipated second edition also includes new material on deep learning. Topics and features: presents an application-focused and hands-on approach to learning, with supplementary teaching resources provided at an associated website; contains numerous study exercises and solutions, highlighted examples, definitions, theorems, and illustrative cartoons; includes chapters on predicate logic, PROLOG, heuristic search, probabilistic reasoning, machine learning and data mining, neural networks and reinforcement learning; reports on developments in deep learning, including applications of neural networks to generate creative

content such as text, music and art (NEW); examines performance evaluation of clustering algorithms, and presents two practical examples explaining Bayes' theorem and its relevance in everyday life (NEW); discusses search algorithms, analyzing the cycle check, explaining route planning for car navigation systems, and introducing Monte Carlo Tree Search (NEW); includes a section in the introduction on AI and society, discussing the implications of AI on topics such as employment and transportation (NEW). Ideal for foundation courses or modules on AI, this easy-to-read textbook offers an excellent overview of the field for students of computer science and other technical disciplines, requiring no more than a high-school level of knowledge of mathematics to understand the material.

AI Ethics Springer

This is an edited volume based on the 2007 Conference on Metadata and Semantics Research (MTRS), now in its second meeting. Metadata research is a pluri-disciplinary field that encompasses all aspects of the definition, creation, assessment, management and use of metadata. The volume brings together world class leaders to contribute their research and up-to-date information on metadata and semantics applied to library management, e-commerce, e-

business, information science and librarianship, to name a few. The book is designed for a professional audience composed of researchers and practitioners in industry.

A Beginners Guide to Python 3 Programming Springer Science & Business Media

This book constitutes the proceedings of the 7th International Symposium on Dependable Software Engineering, SETTA 2021, held in Beijing, China, in November 2021. The 16 full papers in this volume were carefully reviewed and selected from 39 submissions, and are presented with 3 abstracts of keynote speeches. They deal with latest research results and ideas on bridging the gap between formal methods and software engineering.

7th International Symposium, SETTA 2021, Beijing, China, November 25–27, 2021, Proceedings Springer

A rigorous, self-contained introduction to the theory of operational semantics of programming languages and its use.

The Modal Future Springer Nature

It is commonly assumed that we conceive of the past and the future as symmetrical. In this book, Fabrizio Cariani develops a new theory of future-directed discourse and thought that shows that

our linguistic and philosophical conceptions of the past and future are, in fact, fundamentally different. Future thought and talk, Cariani suggests, are best understood in terms of a systematic analogy with counterfactual thought and talk, and are not just mirror images of the past. Cariani makes this case by developing detailed formal semantic theories as well as by advancing less technical views about the nature of future-directed judgment and prediction. His book addresses in a thought-provoking way several important debates in contemporary philosophy, and his synthesis of parallel threads of research will benefit scholars in the philosophy of language, metaphysics, epistemology, linguistics and cognitive science.

The OSP 2 Approach Springer Nature

This book constitutes the proceedings of the 22nd International Conference on Formal Engineering Methods, ICFEM 2020, held in Singapore, Singapore, in March 2021. The 16 full and 4 short papers presented together with 1 doctoral symposium paper in this volume were carefully reviewed and selected from 41 submissions. The papers cover theory and applications in formal engineering methods together with case studies. They also represent the recent development in the use and development of formal engineering methods for software and system development.

Concepts and Semantics of Programming Languages 1 Springer

This classroom-tested textbook provides an accessible introduction to the design, formal modeling, and analysis of distributed computer systems. The book uses Maude, a rewriting logic-based language and simulation and model checking tool, which offers a simple and intuitive modeling formalism that is suitable for modeling distributed systems in an attractive object-oriented and functional programming style. Topics and features: introduces classical algebraic specification and term rewriting theory, including reasoning about termination, confluence, and equational properties; covers object-oriented modeling of distributed systems using rewriting logic, as well as temporal logic to specify requirements that a system should satisfy; provides a range of examples and case studies from different domains, to help the reader to develop an intuitive understanding of distributed systems and their design challenges; examples include classic distributed systems such as transport protocols, cryptographic protocols, and distributed transactions, leader election, and mutual execution algorithms; contains a wealth of exercises, including larger exercises suitable for course projects, and supplies executable code and supplementary material at an associated website. This self-contained textbook is designed to support undergraduate courses on formal methods and distributed systems, and will prove invaluable to any student seeking a reader-friendly introduction to formal specification, logics and inference systems, and automated model checking techniques.

Principles of Data Mining Springer Science & Business Media

This book provides an introduction to the most important basic concepts of computer graphics. It couples the technical background and theory immediately with practical examples and applications. The reader can follow up the theory and then literally see the theory at work in numerous example programs. With only elementary knowledge of the programming language Java, the reader will be able to create his or her own images and animations immediately using Java 2D and Java 3D. A website for this book includes programs with source code, exercises with solutions and slides as teaching material.

Software Languages Springer

An accessible synthesis of ethical issues raised by artificial intelligence that moves beyond hype and nightmare scenarios to address concrete questions. Artificial intelligence powers Google's search engine, enables Facebook to target advertising, and allows Alexa and Siri to do their jobs. AI is also behind self-driving cars, predictive policing, and autonomous weapons that can kill without human intervention. These and other AI applications raise complex ethical issues that are the subject of ongoing debate. This volume in the MIT Press Essential Knowledge series offers an accessible synthesis of these issues. Written by a philosopher of technology, AI Ethics goes beyond the usual hype and nightmare scenarios to address concrete questions. Mark Coeckelbergh describes influential AI narratives, ranging from Frankenstein's monster to transhumanism and the technological singularity. He surveys relevant philosophical discussions: questions about the fundamental differences between humans and machines and debates over the moral status of AI. He explains the technology of AI, describing different approaches and focusing on machine learning and data science. He offers an overview of important ethical issues, including privacy concerns, responsibility and the delegation of decision making, transparency, and bias as it arises at all stages of data science processes. He also considers the future of work in an AI economy. Finally, he analyzes a range of policy proposals and discusses challenges for policymakers. He

argues for ethical practices that embed values in design, translate democratic values into practices and include a vision of the good life and the good society.

Thinking Programs Cambridge University Press

This book explains and explores the principal techniques of Data Mining, the automatic extraction of implicit and potentially useful information from data, which is increasingly used in commercial, scientific and other application areas. It focuses on classification, association rule mining and clustering. Each topic is clearly explained, with a focus on algorithms not mathematical formalism, and is illustrated by detailed worked examples. The book is written for readers without a strong background in mathematics or statistics and any formulae used are explained in detail. It can be used as a textbook to support courses at undergraduate or postgraduate levels in a wide range of subjects including Computer Science, Business Studies, Marketing, Artificial Intelligence, Bioinformatics and Forensic Science. As an aid to self study, this book aims to help general readers develop the necessary understanding of what is inside the 'black box' so they can use commercial data mining packages discriminately, as well as enabling advanced readers or academic researchers to understand or contribute to future technical advances in the field. Each chapter has practical exercises to enable readers to check their progress. A full glossary of technical terms used is included. This expanded third edition includes detailed descriptions of algorithms for classifying streaming data, both stationary data, where the underlying model is fixed, and data that is time-dependent, where the underlying model changes from time to time - a phenomenon known as concept drift.

A Concise Introduction to Software Engineering No Starch Press

Part I of this book is a practical introduction to working with the Isabelle proof assistant. It teaches you how to write functional programs and inductive definitions and how to prove properties about them in Isabelle's structured proof language. Part II is an introduction to the semantics of imperative languages with an emphasis on applications like compilers and program analysers. The distinguishing feature is that all the mathematics has been formalised in Isabelle and much of it is executable. Part I focusses on the details of proofs in Isabelle; Part II can be read even without familiarity with Isabelle's proof language, all proofs are described in detail but informally. The book teaches the reader the art of precise logical reasoning and the practical use of a proof assistant as a surgical tool for formal proofs about computer science artefacts. In this sense it represents a formal approach to computer science, not just semantics. The Isabelle formalisation, including the proofs and accompanying slides, are freely available online, and the book is suitable for graduate students, advanced undergraduate students, and researchers in theoretical computer science and logic.

Introduction to Computer Graphics Cambridge University Press

Software similarity and classification is an emerging topic with wide applications. It is applicable to the areas of malware detection, software theft detection, plagiarism detection, and software clone detection. Extracting program features, processing those features into suitable representations, and constructing distance metrics to define similarity and dissimilarity are the key methods to identify software variants, clones, derivatives, and classes of software. Software Similarity and Classification reviews the literature of those core concepts, in addition to relevant literature in each application and demonstrates that considering these applied problems as a similarity and classification problem enables techniques to be shared between areas. Additionally, the authors present in-depth case studies using the software similarity and classification techniques developed throughout the book.

A Guide to Formal Logical Reasoning Cambridge University Press

This book explains the principal techniques of data mining: for classification, generation of association rules and clustering. It is written for readers without a strong background in mathematics or statistics and focuses on detailed examples and explanations of the algorithms given. This will benefit readers of all levels, from those who use data mining via commercial packages, right through to academic researchers. The book aims to help the general reader develop the necessary understanding to use commercial data mining packages, and to enable advanced readers to understand or contribute to future technical advances. Includes exercises and glossary.

Formal Methods and Software Engineering Springer Nature

This book - the first of two volumes - explores the syntactical constructs of the most common programming languages, and sheds a mathematical light on their semantics, while also providing an accurate presentation of the material aspects that interfere with coding. Concepts and

Semantics of Programming Languages 1 is dedicated to functional and imperative features. Included is the formal study of the semantics of typing and execution; their acquisition is facilitated by implementation into OCaml and Python, as well as by worked examples. Data representation is considered in detail: endianness, pointers, memory management, union types and pattern-matching, etc., with examples in OCaml, C and C++. The second volume introduces a specific model for studying modular and object features and uses this model to present Ada and OCaml modules, and subsequently Java, C++, OCaml and Python classes and objects. This book is intended not only for computer science students and teachers but also seasoned programmers, who will find a guide to reading reference manuals and the foundations of program verification.

With Isabelle/HOL Addison Wesley Publishing Company

This book provides an introduction to the essential concepts in programming languages, using operational semantics techniques. It presents alternative programming language paradigms and gives an in-depth analysis of the most significant constructs in modern imperative, functional and logic programming languages. The book is designed to accompany lectures on programming language design for undergraduate students. Each chapter includes exercises which provide the opportunity to apply the concepts and techniques presented.

Fundamental Approaches to Software Engineering Cambridge University Press

This book constitutes the refereed proceedings of the 24rd Brazilian Symposium on Formal Methods, SBMF 2021, which was held in December 2021. Due to COVID 19-pandemic it took place virtually. The 8 regular papers presented in this book were carefully reviewed and selected from 15 submissions. The papers detail the development, dissemination, and use of formal methods for the construction of high-quality computational systems, aiming to promote opportunities for researchers and practitioners with an interest in formal methods to discuss the recent advances in this area

20 Questions and Answers Semantics with Applications: An Appetizer

Written in a clear, precise and user-friendly style, Logic as a Tool: A Guide to Formal Logical Reasoning is intended for undergraduates in both mathematics and computer science, and will guide them to learn, understand and master the use of classical logic as a tool for doing correct reasoning. It offers a systematic and precise exposition of classical logic with many examples and exercises, and only the necessary minimum of theory. The book explains the grammar, semantics and use of classical logical languages and teaches the reader how grasp the meaning and translate them to and from natural language. It illustrates with extensive examples the use of the most popular deductive systems -- axiomatic systems, semantic tableaux, natural deduction, and resolution -- for formalising and automating logical reasoning both on propositional and on first-order level, and provides the reader with technical skills needed for practical derivations in them. Systematic guidelines are offered on how to perform logically correct and well-structured reasoning using these deductive systems and the reasoning techniques that they employ.

- Concise and systematic exposition, with semi-formal but rigorous treatment of the minimum necessary theory, amply illustrated with examples
- Emphasis both on conceptual understanding and on developing practical skills
- Solid and balanced coverage of syntactic, semantic, and deductive aspects of logic
- Includes extensive sets of exercises, many of them provided with solutions or answers
- Supplemented by a website including detailed slides, additional exercises and solutions

For more information browse the book's website at: <https://logicasatool.wordpress.com>

Principled Software Development No Starch Press

An introductory course on Software Engineering remains one of the hardest subjects to teach largely because of the wide range of topics the area encompasses. I have believed for some time that we often tend to teach too many concepts and topics in an introductory course resulting in shallow knowledge and little insight on application of these concepts. And Software Engineering is not really about application of concepts to efficiently engineer good software solutions. Goals I believe that an introductory course on Software Engineering should focus on imparting to students the knowledge and skills that are needed to successfully execute a commercial project of a few person-months effort while employing proper practices and techniques. It is worth pointing out that a vast majority of the projects executed in the industry today fall in this scope—executed by a small team over a few months. I also believe that by carefully selecting the concepts and topics, we can, in the course of a semester, achieve this. This is the motivation of this book. The goal of this book is to introduce to the students a limited number of concepts and practices which will achieve the following two objectives: - Teach the student the skills needed to execute a smallish

commercial project.

Metadata and Semantics MIT Press

This book is an introduction to the design and implementation of operating systems using OSP 2, the next generation of the highly popular OSP courseware for undergraduate operating system courses. Coverage details process and thread management; memory, resource and I/O device management; and interprocess communication. The book allows students to practice these skills in a realistic operating systems programming environment. An Instructors Manual details how to use

the OSP Project Generator and sample assignments. Even in one semester, students can learn a host of issues in operating system design.

Concise Guide to Object-Oriented Programming Springer

This book is an essential tool for second-year undergraduate students and above, providing clear and concise explanations of the basic concepts of computer graphics, and enabling the reader to immediately implement these concepts in Java 2D and/or 3D with only elementary knowledge of the programming language. Features: provides an ideal, self-contained introduction to computer

graphics, with theory and practice presented in integrated combination; presents a practical guide to basic computer graphics programming using Java 2D and 3D; includes new and expanded content on the integration of text in 3D, particle systems, billboard behaviours, dynamic surfaces, the concept of level of detail, and the use of functions of two variables for surface modelling; contains many pedagogical tools, including numerous easy-to-understand example programs and end-of-chapter exercises; supplies useful supplementary material, including additional exercises, solutions, and program examples, at an associated website.

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