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Languages for System Specification - Christoph Grimm 2007-05-08 Contributions on UML address the application of UML in the specification of embedded HW/SW systems. C-Based System Design embraces the modeling of operating systems, modeling with different models of computation, generation of test patterns, and experiences from case studies with SystemC. Analog and Mixed-Signal Systems covers rules for solving general modeling problems in VHDL-AMS, modeling of multi-nature systems, synthesis, and modeling of Mixed-Signal Systems with SystemC. Languages for formal methods are addressed by contributions on formal specification and refinement of hybrid, embedded and real-time stems. Together with articles on new languages such as SystemVerilog and Software Engineering in Automotive Systems the contributions selected for this book embrace all aspects of languages and models for specification, design, modeling and verification of systems. Therefore, the book gives an excellent overview of the actual state-of-the-art and the latest research results.

Handbook of Automated Reasoning - Alan J.A. Robinson 2001-06-21 Handbook of Automated Reasoning.

Automated Deduction – CADE-20 - Robert Nieuwenhuis 2005-08-25 This volume contains the proceedings of the 20th International Conference on Automated Deduction (CADE-20). It was held July 22–27, 2005 in Tallinn, Estonia...

Theorem Proving in Higher Order Logics - David Basin 2003-09-09 This volume constitutes the proceedings of the16th International Conference on Theorem Proving in Higher Order Logics (TPHOLs 2003) held September 8–12, 2003 in Rome, Italy. TPHOLs covers all aspects of theorem proving in higher order logics as well as related topics in theorem proving and veri?cation. TPHOLs 2003 was co-located with TABLEAUX, the International Con- rence on Automated Reasoning with Analytic Tableaux and Related Methods, and with Calculemus, the Symposium on the Integration of Symbolic Compu- tion and Mechanized Reasoning. There were 50 papers submitted to TPHOLs in the full research category, each of which was refereed by at least 3 reviewers, selected by the program c-mittee.Ofthesesubmissions,21wereacceptedforpresentationattheconference and publication in this volume. In keeping with tradition, TPHOLs 2003 also o?ered a venue for the presentation of work in progress, where researchers - vite discussion by means of a brief preliminary talk and then discuss their work at a poster session. A supplementary proceedings containing associated papers for work in progress was published by the

computer science department at the Universit¨ at Freiburg. The organizers are grateful to Jean-Raymond Abrial, Patrick Lincoln, and Dale Miller for agreeing to give invited talks at TPHOLs 2003. The TPHOLs conference traditionally changes continent each year in order to maximize the chances that researchers from around the world can attend.

Certified Programs and Proofs - Chris Hawblitzel 2012-11-08
This book constitutes the refereed proceedings of the Second International Conference on Certified Programs and Proofs, CPP 2012, held in Kyoto, Japan, in December 2012. The 18 revised regular papers presented were carefully reviewed and selected from 37 submissions. They deal with those topics in computer science and mathematics in which certification via formal techniques is crucial.

Issues in General Physics Research: 2011 Edition - 2012-01-09
Issues in General Physics Research / 2011 Edition is a ScholarlyEditions™ eBook that delivers timely, authoritative, and comprehensive information about General Physics Research. The editors have built Issues in General Physics Research: 2011 Edition on the vast information databases of ScholarlyNews.™ You can expect the information about General Physics Research in this eBook to be deeper than what you can access anywhere else, as well as consistently reliable, authoritative, informed, and relevant. The content of Issues in General Physics Research: 2011 Edition has been produced by the world's leading scientists, engineers, analysts, research institutions, and companies. All of the content is from peer-reviewed sources, and all of it is written, assembled, and edited by the editors at ScholarlyEditions™ and available exclusively from us. You now have a source you can cite with authority, confidence, and credibility. More information is available at http://www.ScholarlyEditions.com/.

Theorem Proving in Higher Order Logics - Yves Bertot 1999-09-01
This book constitutes the refereed proceedings of the 12th International Conference on Theorem Proving in Higher Order Logics, TPHOLs '99, held in Nice, France, in September 1999. The 20 revised full papers presented together with three invited contributions were carefully reviewed and selected from 35 papers submitted. All current aspects of higher order theorem proving, formal verification, and specification are discussed. Among the theorem provers evaluated are COQ, HOL, Isabelle, Isabelle/ZF, and OpenMath.

Symbolic and Quantitative Approaches to Reasoning with Uncertainty - Salem Benferhat 2003-06-30
This book constitutes the refereed proceedings of the 6th European Conference on Symbolic and Quantitative Approaches to Reasoning with Uncertainty, ECSQARU 2001, held in Toulouse, France in September 2001. The 68 revised full papers presented together with three invited papers were carefully reviewed and selected from over a hundred submissions. The book offers topical sections on decision theory, partially observable Markov decision processes, decision-making, coherent probabilities, Bayesian networks, learning causal networks, graphical representation of uncertainty, imprecise probabilities, belief functions, fuzzy sets and rough sets, possibility theory, merging, belief revision and preferences, inconsistency handling, default logic, logic programming, etc.

Computational Complexity - Sanjeev Arora 2009-04-20
New and classical results in computational complexity, including interactive proofs, PCP, derandomization, and quantum computation. Ideal for graduate students.

Recent Advances in AI Planning - Susanne Biundo 2006-12-30
This book constitutes the thoroughly refereed post-proceedings of the 5th European Conference on Planning, ECP'99, held in Durham, UK, in September 1999. The 27 revised full papers presented together with one invited survey were carefully reviewed and selected for inclusion in the book. They address all current aspects of AI planning and scheduling. Several prominent planning paradigms are represented, including planning as satisfiability and other model checking strategies, planning as heuristic state-space search, and Graph-plan-based approaches. Moreover, various new scheduling approaches and combinations of planning and scheduling methods are introduced.

Positive Changes in Political Science - John H. Aldrich 2007

Richard McKelvey's classic papers, accompanied by original essays by leading names in the field

Mathematics Applied to Deterministic Problems in the Natural Sciences - C. C. Lin 1988-12-01

This book addresses the construction, analysis, and intepretation of mathematical models that shed light on significant problems in the physical sciences, with exercises that reinforce, test and extend the reader's understanding. It may be used as an upper level undergraduate or graduate textbook as well as a reference for researchers.

The Road to Universal Logic - Arnold Koslow 2015-06-10

This second volume of a collection of papers offers new perspectives and challenges in the study of logic. It is presented in honor of the fiftieth birthday of Jean-Yves Béziau. The papers touch upon a wide range of topics including paraconsistent logic, quantum logic, geometry of oppositions, categorical logic, computational logic, fundamental logic notions (identity, rule, quantification) and history of logic (Leibniz, Peirce, Hilbert). The volume gathers personal recollections about Jean-Yves Béziau and an autobiography, followed by 25 papers written by internationally distinguished logicians, mathematicians, computer scientists, linguists and philosophers, including Irving Anellis, Dov Gabbay, Ivor Grattan-Guinness, Istvan Németi, Henri Prade. These essays will be of interest to all students and researchers interested in the nature and future of logic.

Algol-like Languages - Peter O'Hearn 2013-03-12

In recent years there has been a remarkable convergence of interest in programming languages based on ALGOL 60. Researchers interested in the theory of procedural and object-oriented languages discovered that ALGOL 60 shows how to add procedures and object classes to simple imperative languages in a general and clean way. And, on the other hand, researchers interested in purely functional languages discovered that ALGOL 60 shows how to add imperative mechanisms to functional languages in a way that does not compromise their desirable properties. Unfortunately, many of the key works in this field have been rather hard to obtain. The primary purpose of this collection is to make the most significant material on ALGoL-like languages conveniently available to graduate students and researchers. Contents Introduction to Volume 1 1 Part I Historical Background 1 Part n Basic Principles 3 Part III Language Design 5 Introduction to Volume 2 6 Part IV Functor-Category Semantics 7 Part V Specification Logic 7 Part VI Procedures and Local Variables 8 Part vn Interference, Irreversibility and Concurrency 9 Acknowledgements 11 Bibliography 11 Introduction to Volume 1 This volume contains historical and foundational material, and works on lan guage design. All of the material should be accessible to beginning graduate students in programming languages and theoretical Computer Science.

Gödel, Putnam, and Functionalism - Jeff Buechner 2007-09-21

The first systematic examination of Hilary Putnam's arguments against computational functionalism challenges each of Putnam's main arguments. With mind-brain identity theories no longer dominant in philosophy of mind in the late 1950s, scientific materialists turned to functionalism, the view that the identity of any mental state depends on its function in the cognitive system of which it is a part. The philosopher Hilary Putnam was one of the primary architects of functionalism and was the first to propose computational functionalism, which views the human mind as a computer or an information processor. But, in the early 1970s, Putnam began to have doubts about functionalism, and in his masterwork Representation and Reality (MIT Press, 1988), he advanced four powerful arguments against his own doctrine of computational functionalism. In Gödel, Putnam, and Functionalism, Jeff Buechner systematically examines Putnam's arguments against functionalism and contends that they are unsuccessful. Putnam's first argument uses Gödel's incompleteness theorem to refute the view that there is a computational description of human reasoning and rationality; his second, the “triviality argument,” demonstrates that any computational description can be attributed to any physical system; his third, the multirealization argument, shows that there are infinitely many computational realizations of an arbitrary intentional state; his fourth argument buttresses this assertion by showing that there cannot be local

computational reductions because there is no computable partitioning of the infinity of computational realizations of an arbitrary intentional state into a single package or small set of packages (equivalence classes). Buechner analyzes these arguments and the important inferential connections among them—for example, the use of both the Gödel and triviality arguments in the argument against local computational reductions—and argues that none of Putnam's four arguments succeeds in refuting functionalism. Gödel, Putnam, and Functionalism will inspire renewed discussion of Putnam's influential book and will confirm Representation and Reality as a major work by a major philosopher.

Thermal Field Theories - H. Ezawa 2012-12-02

Theories of quantum fields at non-zero temperature have been steadily developed for well over a decade. In 1988, as a result of the increased demand for communication among theorists working in different fields ranging from condensed matter physics to high energy physics and astrophysics, the first international meeting was organized (the proceedings of which have been published in Physica A 158, 1989). This 2nd workshop covers similar fields, namely equilibrium and non-equilibrium statistical physics, quantum optics, high-temperature gauge-field theories, string theories, statistical theories of gravitation and cosmology. The resulting proceedings reflect the progress made in the respective fields, identify the major common problems and suggest possible directions for their solutions.

Issues in Robotics and Automation: 2011 Edition - 2012-01-09

Issues in Robotics and Automation / 2011 Edition is a ScholarlyEditions™ eBook that delivers timely, authoritative, and comprehensive information about Robotics and Automation. The editors have built Issues in Robotics and Automation: 2011 Edition on the vast information databases of ScholarlyNews.™ You can expect the information about Robotics and Automation in this eBook to be deeper than what you can access anywhere else, as well as consistently reliable, authoritative, informed, and relevant. The content of Issues in Robotics and Automation: 2011 Edition has been produced by the world’s leading scientists, engineers, analysts, research institutions, and companies. All of the content is from peer-reviewed sources, and all of it is written, assembled, and edited by the editors at ScholarlyEditions™ and available exclusively from us. You now have a source you can cite with authority, confidence, and credibility. More information is available at http://www.ScholarlyEditions.com/.

An Introduction to Kolmogorov Complexity and Its Applications - Ming Li 2013-03-09

Briefly, we review the basic elements of computability theory and prob ability theory that are required. Finally, in order to place the subject in the appropriate historical and conceptual context we trace the main roots of Kolmogorov complexity. This way the stage is set for Chapters 2 and 3, where we introduce the notion of optimal effective descriptions of objects. The length of such a description (or the number of bits of information in it) is its Kolmogorov complexity. We treat all aspects of the elementary mathematical theory of Kolmogorov complexity. This body of knowledge may be called algo rithmic complexity theory. The theory of Martin-Lof tests for random ness of finite objects and infinite sequences is inextricably intertwined with the theory of Kolmogorov complexity and is completely treated. We also investigate the statistical properties of finite strings with high Kolmogorov complexity. Both of these topics are eminently useful in the applications part of the book. We also investigate the recursion theoretic properties of Kolmogorov complexity (relations with Godel's incompleteness result), and the Kolmogorov complexity version of infor mation theory, which we may call "algorithmic information theory" or "absolute information theory. " The treatment of algorithmic probability theory in Chapter 4 presup poses Sections 1. 6, 1. 11. 2, and Chapter 3 (at least Sections 3. 1 through 3. 4).

Technometrics - 2003

Introduction to Calculus and Analysis Volume II/2 - Richard Courant 1999-12-14

From the reviews: "...one of the best textbooks introducing several generations of mathematicians to higher mathematics. ... This excellent book is highly recommended both to instructors and students." --Acta

Scientiarum Mathematicarum, 1991

Proceedings of the Fifth Annual ACM-SIAM Symposium on Discrete Algorithms - 1994-01-01

The January 1994 Symposium was jointly sponsored by the ACM Special Interest Group for Automata and Computability Theory and the SIAM Activity Group on Discrete Mathematics. Among the topics in 79 (unrefereed) papers: comparing point sets under projection; on-line search in a simple polygon; low- degree tests; maximal empty ellipsoids; roots of a polynomial and its derivatives; dynamic algebraic algorithms; fast comparison of evolutionary trees; an efficient algorithm for dynamic text editing; and tight bounds for dynamic storage allocation. No index. Annotation copyright by Book News, Inc., Portland, OR

Mathematics Catalog 2005 - Neil Thomson 2004-10

Harvey Friedman's Research on the Foundations of Mathematics - L.A. Harrington 1985-11-01

This volume discusses various aspects of Harvey Friedman's research in the foundations of mathematics over the past fifteen years. It should appeal to a wide audience of mathematicians, computer scientists, and mathematically oriented philosophers.

Algebraic and Geometric Methods in Statistics - Paolo Gibilisco 2010

An up-to-date account of algebraic statistics and information geometry, which also explores the emerging connections between these two disciplines.

Automated Deduction, CADE ... - 2005

Automated Deduction - A Basis for Applications Volume I Foundations - Calculi and Methods Volume II Systems and Implementation Techniques Volume III Applications - Wolfgang Bibel 2013-03-09

We are invited to deal with mathematical activity in a sys tematic way [...] one does expect and look for pleasant surprises in this requirement of a novel combination of psy chology, logic, mathematics and technology. Hao Wang, 1970, quoted from(Wang, 1970). The field of mathematics has been a key application area for automated theorem proving from the start, in fact the very first automatically found the orem was that the sum of two even numbers is even (Davis, 1983). The field of automated deduction has witnessed considerable progress and in the last decade, automated deduction methods have made their way into many areas of research and product development in computer science. For instance, deduction systems are increasingly used in software and hardware verification to ensure the correctness of computer hardware and computer programs with respect to a given specification. Logic programming, while still falling somewhat short of its expectations, is now widely used, deduc tive databases are well-developed and logic-based description and analysis of hard-and software is commonplace today.

Theorem Proving in Higher Order Logics - Victor A. Carreno 2002-08-07

awidespectrumofareasintheoreticalcomputerscience,formalmethods,and softwareengineering.
ThevenueoftheTPHOLsconferencetraditionallychangescontinenteach yearinordertomaximizethelikelihoodthatresearchersfromallovertheworld willattend. Startingin1993,theproceedingsofTPHOLsanditspredecessor workshopshavebeenpublishedinthefollowingvolumesoftheSpringer-Verlag LectureNotesinComputerScienceseries: 1993(Canada) 780 1998(Australia)1479 1994(Malta) 859 1999(France) 1690 1995(USA) 971 2000(USA) 1869 1996(Finland)1125 2001(UK) 2152 1997(USA) 1275 VI Preface
The2002conferencewasorganizedbyateamfromNASALangleyResearch Center,theICASEInstituteatLangleyResearchCenter,andConcordiaU-versity. FinancialsupportcamefromIntelCorporation.
Thesupportofallthese organizationsisgratefullyacknowledged.
August2002 V´?ctorA. Carreno ˜ C´esarA. Muno ˜z VII Organization
TPHOLs2002isorganizedbyNASALangleyandICASEincooperationwith ConcordiaUniversity. Organizing Committee ConferenceChair: V´?ctorA. Carren˜o(NASALangley) ProgramChair: C´esarA. Muno ˜z(ICASE,NASALaRC) So?`eneTahar(ConcordiaUniversity)

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Cambrian Intelligence - Rodney Allen Brooks 1999

Until the mid-1980s, AI researchers assumed that an intelligent system doing high-level reasoning was necessary for the coupling of perception and action. In this traditional model, cognition mediates between perception and plans of action. Realizing that this core AI, as it was known, was illusory, Rodney A. Brooks turned the field of AI on its head by introducing the behavior-based approach to robotics. The cornerstone of behavior-based robotics is the realization that the coupling of perception and action gives rise to all the power of intelligence and that cognition is only in the eye of an observer. Behavior-based robotics has been the basis of successful applications in entertainment, service industries, agriculture, mining, and the home. It has given rise to both autonomous mobile robots and more recent humanoid robots such as Brooks' Cog. This book represents Brooks' initial formulation of and contributions to the development of the behavior-based approach to robotics. It presents all of the key philosophical and technical ideas that put this "bottom-up" approach at the forefront of current research in not only AI but all of cognitive science.

Report - Carnegie-Mellon University. Dept. of Mathematics 1973

Symbolic Logic and Mechanical Theorem Proving - Chang Chin-Liang 1973

This book contains an introduction to symbolic logic and a thorough

discussion of mechanical theorem proving and its applications. The book consists of three major parts. Chapters 2 and 3 constitute an introduction to symbolic logic. Chapters 4-9 introduce several techniques in mechanical theorem proving, and Chapters 10 an 11 show how theorem proving can be applied to various areas such as question answering, problem solving, program analysis, and program synthesis.

Theoretical Aspects of Computer Software - Japan) TACS'97 (3rd : 1997 : Sendai-han 1997-08-27

Content Description #Includes bibliographical references and index.

Discrete Mathematics - László Lovász 2006-05-10

Aimed at undergraduate mathematics and computer science students, this book is an excellent introduction to a lot of problems of discrete mathematics. It discusses a number of selected results and methods, mostly from areas of combinatorics and graph theory, and it uses proofs and problem solving to help students understand the solutions to problems. Numerous examples, figures, and exercises are spread throughout the book.

The Closed World - Paul N. Edwards 1996

The Closed World offers a radically new alternative to the canonical histories of computers and cognitive science. Arguing that we can make sense of computers as tools only when we simultaneously grasp their roles as metaphors and political icons, Paul Edwards shows how Cold War social and cultural contexts shaped emerging computer technology--and were transformed, in turn, by information machines. The Closed World explores three apparently disparate histories--the history of American global power, the history of computing machines, and the history of subjectivity in science and culture--through the lens of the American political imagination. In the process, it reveals intimate links between the military projects of the Cold War, the evolution of digital computers, and the origins of cybernetics, cognitive psychology, and artificial intelligence. Edwards begins by describing the emergence of a "closed-world discourse" of global surveillance and control through high-technology military power. The Cold War political goal of "containment" led to the SAGE continental air defense system, Rand Corporation studies of nuclear strategy, and the advanced technologies of the Vietnam War. These and other centralized, computerized military command and control projects--for containing world-scale conflicts--helped closed-world discourse dominate Cold War political decisions. Their apotheosis was the Reagan-era plan for a " Star Wars" space-based ballistic missile defense. Edwards then shows how these military projects helped computers become axial metaphors in psychological theory. Analyzing the Macy Conferences on cybernetics, the Harvard Psycho-Acoustic Laboratory, and the early history of artificial intelligence, he describes the formation of a "cyborg discourse." By constructing both human minds and artificial intelligences as information machines, cyborg discourse assisted in integrating people into the hyper-complex technological systems of the closed world. Finally, Edwards explores the cyborg as political identity in science fiction--from the disembodied, panoptic AI of 2001: A Space Odyssey, to the mechanical robots of Star Wars and the engineered biological androids of Blade Runner--where Information Age culture and subjectivity were both reflected and constructed. Inside Technology series

Reflections on the Foundations of Mathematics - Stefania Centrone 2019-11-11

This edited work presents contemporary mathematical practice in the foundational mathematical theories, in particular set theory and the univalent foundations. It shares the work of significant scholars across the disciplines of mathematics, philosophy and computer science. Readers will discover systematic thought on criteria for a suitable foundation in mathematics and philosophical reflections around the mathematical perspectives. The volume is divided into three sections, the first two of which focus on the two most prominent candidate theories for a foundation of mathematics. Readers may trace current research in set theory, which has widely been assumed to serve as a framework for foundational issues, as well as new material elaborating on the univalent foundations, considering an approach based on homotopy type theory (HoTT). The third section then builds on this and is centred on philosophical questions connected to the foundations of mathematics.

Here, the authors contribute to discussions on foundational criteria with more general thoughts on the foundations of mathematics which are not connected to particular theories. This book shares the work of some of the most important scholars in the fields of set theory (S. Friedman), non-classical logic (G. Priest) and the philosophy of mathematics (P. Maddy). The reader will become aware of the advantages of each theory and objections to it as a foundation, following the latest and best work across the disciplines and it is therefore a valuable read for anyone working on the foundations of mathematics or in the philosophy of mathematics.

Logic, Language, Information and Computation - Hiroakira Ono 2009-05-27

Edited in collaboration with FoLLI, the Association of Logic, Language and Information, this book constitutes the 4th volume of the FoLLI LNAI subline; containing the refereed proceedings of the 16h International Workshop on Logic, Language, Information and Computation, WoLLIC 2009, held in Tokyo, Japan, in June 2009. The 25 revised full papers presented together with six tutorials and invited talks were carefully reviewed and selected from 57 submissions. The papers cover some of the most active areas of research on the frontiers between computation, logic, and linguistics, with particular interest in cross-disciplinary topics. Typical areas of interest are: foundations of computing and programming; novel computation models and paradigms; broad notions of proof and belief; formal methods in software and hardware development; logical approach to natural language and reasoning; logics of programs, actions and resources; foundational aspects of information organization, search, flow, sharing, and protection.

Intelligent Systems - Cornelius T. Leondes 2002-08-29

Intelligent systems, or artificial intelligence technologies, are playing an increasing role in areas ranging from medicine to the major manufacturing industries to financial markets. The consequences of flawed artificial intelligence systems are equally wide ranging and can be seen, for example, in the programmed trading-driven stock market crash of October 19, 1987. Intelligent Systems: Technology and Applications, Six Volume Set connects theory with proven practical applications to provide broad, multidisciplinary coverage in a single resource. In these volumes, international experts present case-study examples of successful practical techniques and solutions for diverse applications ranging from robotic systems to speech and signal processing, database management, and manufacturing.

Computer Systems and Software Engineering - Patrick DeWilde 2012-12-06

Computer Systems and Software Engineering is a compilation of sixteen state-of-the-art lectures and keynote speeches given at the COMPEURO '92 conference. The contributions are from leading researchers, each of whom gives a new insight into subjects ranging from hardware design through parallelism to computer applications. The pragmatic flavour of the contributions makes the book a valuable asset for both researchers and designers alike. The book covers the following subjects: Hardware Design: memory technology, logic design, algorithms and architecture; Parallel Processing: programming, cellular neural networks and load balancing; Software Engineering: machine learning, logic programming and program correctness; Visualization: the graphical computer interface.

Introduction to Random Graphs - Alan Frieze 2016

The text covers random graphs from the basic to the advanced, including numerous exercises and recommendations for further reading.

UML-B Specification for Proven Embedded Systems Design - Jean Mermet 2013-03-19

This book presents the perspective of the project on a Paradigm Unifying System Specification Environments for proven Electronic design (PUS SEE) as conceived in the course of the research during 2002 -2003. The initial statement of the research was formulated as follows: The objective of PUSSEE is to introduce the formal proof of system properties throughout a modular system design methodology that integrates sub-systems co-verification with system refinement and reusability of virtual system components. This will be done by combining the UML and B languages to allow the verification of system specifications through the

composition of proven sub-systems (in particular interfaces, using the VSIAISLIF standard). The link of B with C, VHDL and SystemC will extend the correct-by-construction design process to lower system-on-chip (SoC) development stages. Prototype tools will be developed for the code generation from UML and B, and existing B verification tools will be extended to support IP reuse, according to the VSI Alliance work. The methodology and tools will be validated through the development of three industrial applications: a wireless mobile terminal-a telecom system-on-chip based on HIPERLANI2 protocol and an anti-collision module for automobiles. The problem was known to be hard and the scope ambitious. But the seventeen chapters that follow, describing the main results obtained demonstrate the success of the research, acknowledged by the European reviewers. They are released to allow the largest audience to learn and take benefit of.

Logic and Computation - Wilfried Sieg 1990

This volume contains the proceedings of the Workshop on Logic and Computation, held in July 1987 at Carnegie-Mellon University. The focus of the workshop was the refined interaction between mathematics and computation theory, one of the most fascinating and potentially fruitful developments in logic. The importance of this interaction lies not only in the emergence of the computer as a powerful tool in mathematics research, but also in the various attempts to carry out significant parts of mathematics in computationally informative ways. The proceedings pursue three complementary aims: to develop parts of mathematics under minimal set-theoretic assumptions; to provide formal frameworks suitable for computer implementation; and to extract, from formal proofs, mathematical and computational information. Aimed at logicians, mathematicians, and computer scientists, this volume is rich in results and replete with mathematical, logical, and computational problems.