Meta Programming In Logic Lecture Notes In Computer Science Volume 649

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Object-Oriented Technology. ECOOP '98 Workshop Reader Serge Demeyer 1998-12-11 At the time of writing (mid-October 1998) we can look back at what has been a very successful ECOOP'98. Despite the time of the year – in the middle of what is traditionally regarded as a holiday period – ECOOP'98 was a record breaker in terms of number of participants. Over 700 persons found their way to the campus of the Brussels Free University to participate in a wide range of activities. This 3rd ECOOP workshop reader reports on many of these activities. It contains a careful selection of the input and a cautious summary of the outcome for the numerous discussions that happened during the workshops, demonstrations and posters. As such, this book serves as an excellent snapshot of the state of the art in the field of object oriented programming. About the diversity of the submissions A workshop reader is, by its very nature, quite diverse in the topics covered as well as in the form of its contributions. This reader is not an exception to this rule: as editors we have given the respective organizers much freedom in their choice of presentation because we feel form follows content. This explains the diversity in the types of reports as well as in their lay out.

Issues in Agent Communication Frank Dignum 2006-12-31 A first attempt to develop a standardized agent communication language (ACL) resulted in KQML, probably the most widely used such language. However, a lot of technical work remains to be done. Even worse, so far, there seems to be little consensus on the basics of agent communication and there is no clear understanding of the semantics of individual speech acts or even of the basic concepts that should be used to define the semantics. This book documents two workshops on communication in MAS held in 1999, one on Specifying and Implementing Conversation Policies (SICP) and the other in Agent Communication Languages and presents the current state of the art of research in the field. A detailed introductory overview by the volume editors highlights a number of issues that play an important role in agent communication.

Meta-programming in Logic Programming Harvey Abramson 1989 Meta-programs, which treat other computer programs as data, include compilers, editors, simulators, debuggers, and program transformers. Because of the wide ranging applications, meta-programming has become a subject of considerable practical and theoretical interest. This book provides the first comprehensive view of topics in the theory and application of meta-programming, covering problems of representation and of soundness and correctness of interpreters, analysis and evaluation of meta-logic programs, and applications to sophisticated knowledge-based systems.Harvey Abramson is Reader in Computer Science at the University of Bristol, England; M. H. Rogers is Professor of Computer Science, also at the University of Bristol. Meta-Programming in Logic Programming is in the series Logic Programming Research Reports and Notes, edited by Ehud Shapiro.

Concurrency and Parallelism, Programming, Networking, and Security Joxan Jaffar 1996-11-19 This book constitutes the refereed proceedings of the Second Asian Conference on Computing Science, ASIAN'96, held in Singapore in December 1996. The volume presents 31 revised full papers selected from a total of 169 submissions; also included are three invited papers and 14 posters. The papers are organized in topical sections on algorithms, constraints and logic programming, distributed systems, formal systems, networking and security, programming and systems, and specification and verification.

Geographic Data Imperfection 1 Mireille Batton-Hubert 2019-08-16 Geomatics is a field of science that has been intimately intertwined with our daily lives for almost 30 years, to the point where we often forget all the challenges it entails. Who does not have a navigation application on their phone or regularly engage with geolocated data? What is more, in the coming decades, the accumulation of geo-referenced data is expected to increase significantly. This book focuses on the notion of the imperfection of geographic data, an important topic in geomatics. It is essential to be able to define and represent the imperfections that are encountered in geographical data. Ignoring these imperfections can lead to many risks, for example in the use of maps which may be rendered inaccurate. It is, therefore, essential to know how to model and treat the different categories of imperfection. A better awareness of these imperfections will improve the analysis and the use of this type of data.

Flexible Query Answering Systems Troels Andreasen 2012-12-06 Flexible Query Answering Systems is an edited collection of contributed chapters. It focuses on developing computer systems capable of transforming a query into an answer with useful information. The emphasis is on problems associated with high-level intelligent answering systems. The coverage is multidisciplinary with chapters by authors from information science, logic, fuzzy systems, databases, artificial intelligence and knowledge representation. Each contribution represents a theory involving flexibility in query-answering, and each addresses specific answering problems. Coverage includes topics such as fuzzy sets in flexible querying, non-standard database interactions, metareasoning and agents, and many others. Contributions for this volume were written by leading researchers from their respective subject areas, including Patrick Bosc, Bernadette Bouchon-Meunier, Amihai Motro, Henri Prade and Ron Yager, among others. Flexible Query Answering Systems is a timely contribution for researchers working on high-level query mechanism systems.

Logic Program Synthesis and Transformation Yves Deville 2012-12-06 This volume contains extended versions of papers presented at the Third International Workshop on Logic Program Synthesis and Transformation (LOPSTR 93) held in Louvain-la-Neuve in July 1993. Much of the success of the workshop is due to Yves Deville who served as Organizer and Chair. Many people believe that machine support for the development and evolution of software will play a critical role in future software engineering environments. Machine support requires the formalization of the artifacts and processes that arise during the software lifecycle. Logic languages are unique in providing a uniform declarative notation for precisely describing application domains, software requirements, and for prescribing behavior via logic programs. Program synthesis and transfonnation techniques formalize the process of developing correct and efficient programs from requirement specifications. The natural intersection of these two fields of research has been the focus of the LOPSTR workshops. The papers in this volume address many aspects of software develop ment including: deductive synthesis, inductive synthesis, transforma tions for optimizing programs and exploiting parallelism, program analysis techniques (particularly via abstract interpretation), meta programming languages and tool support, and various extensions to Prolog-like languages, admitting non-Horn clauses, functions, and constraints. Despite the progress represented in this volume, the transition from laboratory to practice is fraught with difficulties.

Meta-Level Architectures and Reflection Pierre Cointe 2003-06-29 This book constitutes the refereed proceedings of the Second International Conference on Meta-Level Architectures and Reflection, Reflection'99, held in St. Malo, France in July 1999. The 13 revised full papers presented were carefully selected from 44 submissions. Also included are six short papers and the abstracts of three invited talks. The papers are organized in sections on programming languages, meta object protocols, middleware/multi-media, work in progress, applications, and meta-programming. The volume covers all current issues arising in the design and analysis of reflective systems and demontrates their practical applications.

Logic for Programming, Artificial Intelligence, and Reasoning Miki Hermann 2006-10-23 This book constitutes the refereed proceedings of the 13th International Conference on Logic for Programming, Artificial Intelligence, and Reasoning, LPAR 2006, held in Phnom Penh, Cambodia in November 2006. The 38 revised full papers presented together with one invited talk were carefully reviewed and selected from 96 submissions.

Reasoning with Actual and Potential Contradictions Philippe Besnard 1998-10-31 This volume deals with approaches to handling contradictory information. These include approaches for actual contradiction - both A and not-A can be proven from the information - and approaches for potential contradiction - where the information may contain arguments for A and arguments for not-A, but the system suppresses the contradiction by, for example, preferring some arguments over others. Approaches covered include paraconsistent logics, modal logics, default logics, conditional logics, defeasible logics and paraconsistent semantics for logic programming. The volume is of interest to students, researchers and practitioners in artificial intelligence, software engineering, logic, language and philosophy. This volume is the first handbook to give a comprehensive coverage of handling contradictory information.

Logic Program Synthesis and Transformation Norbert E. Fuchs 2003-05-20 This volume contains the papers from the Seventh International Workshop on Logic Program Synthesis and Transformation, LOPSTR '97, that took place in Leuven, Belgium, on July 10–12, 1997, 'back to back' with the Fourteenth International Conference on Logic Programming, ICLP '97. Both ICLP and LOPSTR were organised by the K.U. Leuven Department of Computer Science. LOPSTR '97 was sponsored by Compulog Net and by the Flanders Research Network on Declarative Methods in Computer Science. LOPSTR '97 had 39 participants from 13 countries. There were two invited talks by Wolfgang Bibel (Darmstadt) on 'A multi level approach to program synthesis', and by Henning Christiansen (Roskilde) on 'Implicit program synthesis by a reversible metainterpreter'. Extended versions of both talks appear in this volume. There were 19 technical papers accepted for presentation at LOPSTR '97, out of 33 submissions. Of these, 15 appear in extended versions in this volume. Their topics range over the fields of program synthesis, program transformation, program analysis, tabling, metaprogramming, and inductive logic programming.

Computational Conflicts Heinz J. Müller 2012-12-06 This book brings together approaches from different subfields of artificial intelligence as well as adjoint disciplines in order to characterize a "computational model" of conflicts.

Advances in Formal Design Methods for CAD Asko Riitahuhta 2013-03-09 Designing is one of the most significant of human acts. Surprisingly, given that designing has been occurring for many millenia, our understanding of the processes of designing is remarkably limited. Recently, design methods have been formalised not as humano-centred processes but as processes capable of computer implementation with the goal of augmenting human designers. This volume contains contributions which cover design methods based on evolutionary systems, generative processes, evaluation methods and analysis methods. It presents the state of the art in formal design methods for computer aided design.

Logic Programming and Automated Reasoning Frank Pfenning 1994-06-22 This volume presents the proceedings of the 5th International Conference on Logic Programming and Automated Reasoning, held aboard the ship "Marshal Koshevoi" on the Dnieper near Kiev, Ukraine in July 1994. The LPAR conferences are held annually in the former Soviet Union and aimed at bringing together researchers interested in LP and AR. This proceedings contains the full versions of the 24 accepted papers evaluated by at least three referees ensuring a program of highest quality. The papers cover all relevant aspects of LP and AR ranging from theory to implementation and application.

Analysis and Visualization Tools for Constraint Programming Pierre Deransart 2006-12-31 Coordinating production across a supply chain, designing a new VLSI chip, allocating classrooms or scheduling maintenance crews at an airport are just a few examples of complex (combinatorial) problems that can be modeled as a set of decision variables whose values are subject to a set of constraints. The decision variables may be the time when production of a particular lot will start or the plane that a maintenance crew will be working on at a given time. Constraints may range from the number of students you can ?t in a given classroom to the time it takes to transfer a lot from one plant to another.Despiteadvancesincomputingpower,manyformsoftheseandother combinatorial problems have continued to defy conventional programming approaches. Constraint Logic Programming (CLP) ?rst emerged in the mid-eighties as a programming technique with the potential of signi?cantly reducing the time it takes to develop practical solutions to many of these problems, by combining the expressiveness of languages such as Prolog with the compu- tional power of constrained search. While the roots of CLP can be traced to Monash University in Australia, it is without any doubt in Europe that this new software technology has gained the most prominence, bene?ting, among other things, from sustained funding from both industry and public R&D programs over the past dozen years. These investments have already paid o?, resulting in a number of popular commercial solutions as well as the creation of several successful European startups.

Logic Programming David S. Warren 1993 The Tenth International Conference on Logic Programming, sponsored by the Association for Logic Programming, is a major forum for presentations of research, applications, and implementations in this important area of computer science. Logic programming is one of the most promising steps toward declarative programming and forms the theoretical basis of the programming language Prolog and it svarious extensions. Logic programming is also fundamental to work in artificial intelligence, where it has been used for nonmonotonic and commonsense reasoning, expert systems implementation, deductive databases, and applications such as computer-aided manufacturing.David S. Warren is Professor of Computer Science at the State University of New York, Stony Brook.Topics covered: Theory and Foundations. Programming Methodologies and Tools. Meta and Higher-order Programming. Parallelism. Concurrency. Deductive Databases. Implementations and Architectures. Applications. Artificial Intelligence. Constraints. Partial Deduction. Bottom-Up Evaluation. Compilation Techniques.

Meta-Programming in Logic Alberto Pettorossi 1992-12-02 This volume contains lectures and papers delivered at Meta 92, the Third International Workshop on Metaprogramming in Logic, held in Uppsala, Sweden,June 1992. The topics covered include foundations of metaprogramming in logic, proposals for metaprogramming languages, techniques for knowledgerepresentation and belief systems, and program transformation and analysis in logic. Particular topics include belief revision systems, intensionaldeduction, belief systems and metaprogramming, principles of partial deduction, termination in logic programs, semantics of the "vanilla" metainterpreter, a complete resolution method for metaprogramming, semanticsof "demo", hierarchical metalogics, the naming relation in metalevel systems, modules, reflective agents, compiler optimizations, metalogic and object-oriented facilities, parallel logic languages, the use of metaprogramming for legal reasoning, representing objects and inheritance, transformation of normal programs, negation in automatically generated logic programs, reordering of literals in deductive databases, abstract interpretations, and interarguments in constraint logic programs.

Logic Program Synthesis and Transformation - Meta-Programming in Logic Laurent Fribourg 1994-11-30 This volume constitutes the combined proceedings of the 4th International Workshops on Logic Program Synthesis and Transformation (LOPSTR '94) and on Meta-Programming (META '94), held jointly in Pisa, Italy in June 1994. This book includes thoroughly revised versions of the best papers presented at both workshops. The main topics addressed by the META papers are language extensions in support of meta-logic, semantics of meta-logic, implementation of meta-logic features, performance of meta-logic, and several applicational aspects. The LOPSTR papers are devoted to unfolding/folding, partial deduction, proofs as programs, inductive logic programming, automated program verification, specification and programming methodologies.

Topics in Artificial Intelligence Italian Association for Artificial Intelligence. Congress 1995-09-27 This book presents the refereed proceedings of the 4th Congress of the Italian Association for Artificial Intelligence, AI*IA '95, held in Florence, Italy, in October 1995. The 31 revised full papers and the 12 short presentations contained in the volume were selected from a total of 101 submissions on the basis of a careful reviewing process. The papers are organized in sections on natural language processing, fuzzy systems, machine learning, knowledge representation, automated reasoning, cognitive models, robotics and planning, connectionist models, model-based reasoning, and distributed artificial intelligence.

Automated Deduction, Cade-12. Alan Bundy 1994-06-08 This volume contains the reviewed papers presented at the 12th International Conference on Automated Deduction (CADE-12) held at Nancy, France in June/July 1994. The 67 papers presented were selected from 177 submissions and document many of the most important research results in automated deduction since CADE-11 was held in June 1992. The volume is organized in chapters on heuristics, resolution systems, induction, controlling resolutions, ATP problems, unification, LP applications, special-purpose provers, rewrite rule termination, ATP efficiency, AC unification, higher-order theorem proving, natural systems, problem sets, and system descriptions.

Parallel and Distributed Processing Jose Rolim 2003-06-26 This volume contains the proceedings from the workshops held in conjunction with the IEEE International Parallel and Distributed Processing Symposium, IPDPS 2000, on 1-5 May 2000 in Cancun, Mexico. The workshopsprovidea forum for bringing together researchers,practiti- ers, and designers from various backgrounds to discuss the state of the art in parallelism.Theyfocusondi erentaspectsofparallelism,fromruntimesystems to formal methods, from optics to irregular problems, from biology to networks of personal computers, from embedded systems to programming environments; the following workshops are represented in this volume: { Workshop on Personal Computer Based Networks of Workstations { Workshop on Advances in Parallel and Distributed Computational Models { Workshop on Par. and Dist. Comp. in Image, Video, and Multimedia { Workshop on High-Level Parallel Prog. Models and Supportive Env. { Workshop on High Performance Data Mining { Workshop on Solving Irregularly Structured Problems in Parallel { Workshop on Java for Parallel and Distributed Computing { WorkshoponBiologicallyInspiredSolutionsto ParallelProcessingProblems { Workshop on Parallel and Distributed Real-Time Systems { Workshop on Embedded HPC Systems and Applications { Recon gurable Architectures Workshop { Workshop on Formal Methods for Parallel Programming { Workshop on Optics and Computer Science { Workshop on Run-Time Systems for Parallel Programming { Workshop on Fault-Tolerant Parallel and Distributed Systems All papers published in the workshops proceedings were selected by the p- gram committee on the basis of referee reports. Each paper was reviewed by independent referees who judged the papers for originality, quality, and cons- tency with the themes of the workshops.

Computational Logic: Logic Programming and Beyond Antonis C. Kakas 2003-08-02 Alan Robinson This set of essays pays tribute to Bob Kowalski on his 60th birthday, an anniversary which gives his friends and colleagues an excuse to celebrate his career as an original thinker, a charismatic communicator, and a forceful intellectual leader. The logic programming community hereby and herein conveys its respect and thanks to him for his pivotal role in creating and fostering the conceptual paradigm which is its raison d'Œtre. The diversity of interests covered here reflects the variety of Bob's concerns. Read on. It is an intellectual feast. Before you begin, permit me to send him a brief personal, but public, message: Bob, how right you were, and how wrong I was. I should explain. When Bob arrived in Edinburgh in 1967 resolution was as yet fairly new, having taken several years to become at all widely known. Research groups to investigate various aspects of resolution sprang up at several institutions, the one organized by Bernard Meltzer at Edinburgh University being among the first. For the half-dozen years that Bob was a leading member of Bernard's group, I was a frequent visitor to it, and I saw a lot of him. We had many discussions about logic, computation, and language.

Logics in Artificial Intelligence Craig MacNish 1994-08-10 This book constitutes the proceedings of the 1994 European Workshop on Logics in Artificial Intelligence, held at York, UK in September 1994. The 24 papers presented were selected from a total of 79 submissions; in addition there are two abstracts of invited talks and one full paper of the invited presentation by Georg Gottlob. The papers point out that, with the depth and maturity of formalisms and methodologies available in AI today, logics provide a formal basis for the study of the whole field of AI. The volume offers sections on nonmonotonic reasoning, automated reasoning, logic programming, knowledge representation, and belief revision.

Computer Science Research Trends Casey B. Yarnall 2008 Like them or hate them, computers are here to stay. The books in this series present leading-edge research in the field of computer research, technology and applications. Each contribution has been carefully selected for inclusion based on the significance of the research to this fast-moving and diverse field.

Logic Program Synthesis and Transformation Maurizio Proietti 1996-03-06 This book constitutes the refereed proceedings of the 5th International Workshop on Logic Program Synthesis and Transformation, LOPSTR'95, held in Utrecht, The Netherlands in September 1995. The 19 papers included were selected from 40 workshop submissions; they offer a unique up-to-date account of the use of formal synthesis and transformation techniques for computer-aided development of logic programs. Among the topics addressed are deductive and inductive program synthesis, synthesis models based on constructive type theory, program specification, program analysis, theorem proving, and applications to various types of programs.

Logics for Databases and Information Systems Jan Chomicki 2012-12-06 Time is ubiquitous in information systems. Almost every enterprise faces the problem of its data becoming out of date. However, such data is often valu able, so it should be archived and some means to access it should be provided. Also, some data may be inherently historical, e.g., medical, cadastral, or ju dicial records. Temporal databases provide a uniform and systematic way of dealing with historical data. Many languages have been proposed for tem poral databases, among others temporal logic. Temporal logic combines ab stract, formal semantics with the amenability to efficient implementation. This chapter shows how temporal logic can be used in temporal database applica tions. Rather than presenting new results, we report on recent developments and survey the field in a systematic way using a unified formal framework [GHR94; Ch094]. The handbook [GHR94] is a comprehensive reference on mathematical foundations of temporal logic. In this chapter we study how temporal logic is used as a query and integrity constraint language. Consequently, model-theoretic notions, particularly for mula satisfaction, are of primary interest. Axiomatic systems and proof meth ods for temporal logic [GHR94] have found so far relatively few applications in the context of information systems. Moreover, one needs to bear in mind that for the standard linearly-ordered time domains temporal logic is not re cursively axiomatizable [GHR94]' so recursive axiomatizations are by necessity incomplete.

Multi-Agent Rationality European Workshop on Modelling Autonomous Agents in a Multi-Agent World 1997-05-02 In these notes on 'Projective Modules and Complete Intersections' an account on the recent developments in research on this subject is presented. The author's preference for the technique of Patching isotopic isomorphisms due to Quillen, formalized by Plumsted, over the techniques of elementary matrices is evident here. The treatment of Basic Element theory here incorporates Plumstead's idea of the 'generalized dimension functions'. These notes are highly selfcontained and should be accessible to any graduate student in commutative algebra or algebraic geometry. They include fully self-contained presentations of the theorems of Ferrand-Szpiro, Cowsik-Nori and the techniques of Lindel.

Principles of Knowledge Representation and Reasoning Jon Doyle 1994 The proceedings of KR '94 comprise 55 papers on topics including deduction an search, description logics, theories of knowledge and belief, nonmonotonic reasoning and belief revision, action and time, planning and decision-making and reasoning about the physical world, and the relations between KR

Dynamics and Management of Reasoning Processes John-Jules Ch. Meyer 2013-04-17 This volume, the 6th volume in the DRUMS Handbook series, is part of the after math of the successful ESPRIT project DRUMS (Defeasible Reasoning and Un certainty Management Systems) which took place in two stages from 1989-1996. In the second stage (1993-1996) a work package was introduced devoted to the topics Reasoning and Dynamics, covering both the topics of 'Dynamics of Rea soning', where reasoning is viewed as a process, and 'Reasoning about Dynamics', which must be understood as pertaining to how both designers of and agents within dynamic systems may reason about these systems. The present volume presents work done in this context. This work has an emphasis on modelling and formal techniques in the investigation of the topic "Reasoning and Dynamics", but it is not mere theory that occupied us. Rather research was aimed at bridging the gap between theory and practice. Therefore also real-life applications of the modelling techniques were considered, and we hope this also shows in this volume, which is focused on the dynamics of reasoning processes. In order to give the book a broader perspective, we have invited a number of well-known researchers outside the project but working on similar topics to contribute as well. We have very pleasant recollections of the project, with its lively workshops and other meetings, with the many sites and researchers involved, both within and outside our own work package.

Euro-Par 2000 Parallel Processing Arndt Bode 2000-08-23 Euro-Par – the European Conference on Parallel Computing – is an international conference series dedicated to the promotion and advancement of all aspects of parallel computing. The major themes can be divided into the broad categories of hardware, software, algorithms, and applications for parallel computing. The objective of Euro-Par is to provide a forum within which to promote the dev- opment of parallel computing both as an industrial technique and an academic discipline, extending the frontier of both the state of the art and the state of the practice. This is particularlyimportant at a time when parallel computing is - dergoing strong and sustained development and experiencing real industrial take up. The main audience for and participants of Euro-Par are seen as researchers in academic departments, government laboratories, and industrial organisations. Euro-Par's objective is to become the primarychoice of such professionals for the presentation of new results in their speci?c areas. Euro-Par is also interested in applications that demonstrate the e?ectiveness of the main Euro-Par themes. Euro-Par now has its own Internet domain with a permanent Web site where the historyof the conference series is described: http://www. euro-par. org. The Euro-Par conference series is sponsored bythe Association of Computer Machineryand the International Federation of Information Processing.

The Gödel Programming Language Patricia Hill 1994 This book gives a tutorial overview of Gödel, presents example programs, provides a formal definition of the syntax and semantics of the language, and covers background material on logic. Gödel is a new, general-purpose, declarative programming language that is based on the paradigm of logic programming and can be regarded as a successor to Prolog. This book gives a tutorial overview of Gödel, presents example programs, provides a formal definition of the syntax and semantics of the language, and covers background material on logic. The Gödel language supports types and modules. It has a rich collection of system modules and provides constraint solving in several domains. It also offers metalogical facilities that provide significant support for metaprograms that do analysis, transformation, compilation, verification, debugging, and the like. The declarative nature of Gödel makes it well suited for use as a teaching language, narrows the gap that currently exists between theory and practice in logic programming, makes possible advanced software engineering tools such as declarative debuggers and compiler generators, reduces the effort involved in providing a parallel implementation of the language, and offers substantial scope for parallelization in such implementations. Logic Programming series

Agent-Based Defeasible Control in Dynamic Environments John-Jules Ch. Meyer 2013-03-09 This volume, the 7th volume in the DRUMS Handbook series, is part of the aftermath of

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the successful ESPRIT project DRUMS (Defeasible Reasoning and Uncertainty Management Systems) which took place in two stages from 1989- 1996. In the second stage (1993-1996) a work package was introduced devoted to the topics Reasoning and Dynamics, covering both the topics of "Dynamics of Reasoning", where reasoning is viewed as a process, and "Reasoning about Dynamics", which must be understood as pertaining to how both designers of and agents within dynamic systems may reason about these systems. The present volume presents work done in this context extended with some work done by outstanding researchers outside the project on related issues. While the previous volume in this series had its focus on the dynamics of reasoning pro cesses, the present volume is more focused on "reasoning about dynamics', viz. how (human and artificial) agents reason about (systems in) dynamic environments in order to control them. In particular we consider modelling frameworks and generic agent models for modelling these dynamic systems and formal approaches to these systems such as logics for agents and formal means to reason about agent based and compositional systems, and action & change more in general. We take this opportunity to mention that we have very pleasant recollections of the project, with its lively workshops and other meetings, with the many sites and researchers involved, both within and outside our own work package.

Mental Models and Their Dynamics, Adaptation, and Control Jan Treur 2022 This book introduces a generic approach to model the use and adaptation of mental models, including the control over this. In their mental processes, humans often make use of internal mental models as a kind of blueprints for processes that can take place in the world or in other persons. By internal mental simulation of such a mental model in their brain, they can predict and be prepared for what can happen in the future. Usually, mental models are adaptive: they can be learned, refined, revised, or forgotten, for example. Although there is a huge literature on mental models in various disciplines, a systematic account of how to model them computationally in a transparent manner is lacking. This approach allows for computational modeling of humans using mental models without a need for any algorithmic or programming skills, allowing for focus on the process of conceptualizing, modeling, and simulating complex, real-world mental processes and behaviors. The book is suitable for and is used as course material for multidisciplinary Master and Ph.D. students.

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A Proof Theory for General Unification W. Snyder 2012-12-06 In this monograph we study two generalizations of standard unification, E-unification and higher-order unification, using an abstract approach orig inated by Herbrand and developed in the case of standard first-order unifi cation by Martelli and Montanari. The formalism presents the unification computation as a set of non-deterministic transformation rules for con verting a set of equations to be unified into an explicit representation of a unifier (if such exists). This provides an abstract and mathematically elegant means of analysing the properties of unification in various settings by providing a clean separation of the logical issues from the specification of procedural information, and amounts to a set of 'inference rules' for unification, hence the title of this book. We derive the set of transformations for general E-unification and higher order unification from an analysis of the sense in which terms are 'the same' after application of a unifying substitution. In both cases, this results in a simple extension of the set of basic transformations given by Herbrand Martelli-Montanari for standard unification, and shows clearly the basic relationships of the fundamental operations necessary in each case, and thus the underlying structure of the most important classes of term unifi cation problems.

Abduction and Induction P.A. Flach 2013-04-18 From the very beginning of their investigation of human reasoning, philosophers have identified two other forms of reasoning, besides deduction, which we now call abduction and induction. Deduction is now fairly well understood, but abduction and induction have eluded a similar level of understanding. The papers collected here address the relationship between abduction and induction and their possible integration. The approach is sometimes philosophical, sometimes that of pure logic, and some papers adopt the more task-oriented approach of AI. The book will command the attention of philosophers, logicians, AI researchers and computer scientists in general.

Logic Based Program Synthesis and Transformation Sandro Etalle 2005-06-24 This book constitutes the thoroughly refereed postproceedings of the 14th International Symposium on Logic Based Program Synthesis and Transformation, LOPSTR 2004, held in Verona, Italy in August 2004. The 17 revised full papers presented were carefully selected and revised from 23 full paper and 11 extended abstract submissions. The papers are organized in topical sections on verification and analysis, theory and security, transformations, program development, termination, and program development and synthesis.

Computer Science and Quantum Computing Jeremy E. Stones 2006 This book presents leading-edge research in the field of computer science research including quantum computing, technology and applications. Each contribution has been carefully selected for inclusion based on the significance of the research to the field. Summaries of all chapters are gathered at the beginning of the book and an in-depth index is presented to facilitate access.

Computational Logic: Logic Programming and Beyond Robert Kowalski 2002-07-12 This volume spans the whole field of computational logic seen from the point of view of logic programming. The topics addressed range from issues concerning the development of programming languages in logic and the application of computational logic to real-life problems, to philosophical studies of the field at the other end of the spectrum. The articles presented cover the contributions of computational logic to databases and artificial intelligence with particular emphasis on automated reasoning, reasoning about actions and change, natural languages, and learning. Together with its companion volume, LNAI 2407, this book commemorates the 60th birthday of Bob Kowalski as one of the founders of and contributors to computational logic.

Reasoning with Actual and Potential Contradictions Dov M. Gabbay 2013-04-17 We are happy to present the second volume of the Handbook of Defeasible Reasoning and Uncertainty Management Systems. Uncertainty pervades the real world and must therefore be addressed by every system that attempts to represent reality. The representation of un certainty is a major concern of philosophers, logicians, artificial intelligence researchers and computer sciencists, psychologists, statisticians, economists and engineers. The present Handbook volumes provide frontline coverage of this area. This Handbook was produced in the style of previous handbook series like the Handbook of Philosophical Logic, the Handbook of Logic in Computer Science, the Handbook of Logic in Artificial Intelligence and Logic Programming, and can be seen as a companion to them in covering the wide applications of logic and reasoning. We hope it will answer the needs for adequate representations of uncertainty. This Handbook series grew out of the ESPRIT Basic Research Project DRUMS II, where the acronym is made out of the Handbook series title. This project was financially supported by the European Union and regroups 20 major European research teams working in the general domain of uncer tainty. As a fringe benefit of the DRUMS project, the research community was able to create this Handbook series, relying on the DRUMS partici pants as the core of the authors for the Handbook together with external international experts.

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