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**Prolog and Its Applications**
- F U M I O MIZOGUCHI - 2013-12-14

**Prolog Programming**
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**Prolog**
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**Logic Programming**
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**Bond**
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**Programming in Prolog**
- W. F. Clocksin - 2012-12-06

The computer programming language Prolog is quickly gaining popularity throughout the world. Since its beginnings around 1970, Prolog has been chosen by many programmers for applications of symbolic computation. Including: D relational databases D mathematical logic D abstract problem solving D understanding natural language D architectural design D symbolic equation solving D biochemical structure analysis D many areas of artificial Intelligence Until now, there has been no textbook with the aim of teaching Prolog as a practical programming language. It is perhaps a tribute to Prolog that so many people have been motivated to learn it by referring to the necessarily concise reference manuals. a few published papers. and by the orally transmitted ‘folklore’ of the modern computing community. However, as Prolog is beginning to be introduced to large numbers of undergraduate and postgraduate students. many of our colleagues have expressed a great need for a tutorial guide to learning Prolog. We hope this little book will go some way towards meeting this need. Many newcomers to Prolog find that the task of writing a Prolog program is not like specifying an algorithm in the same way as In a conventional programming language. Instead, the Prolog programmer asks more what formal relationships and objects occur in his problem.

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**Programming with Higher-Order Logic**
- Dale Miller - 2012-06-11

Formal systems that describe computations over syntactic structures occur frequently in computer science. Logic programming provides a natural framework for encoding and animating such systems. However, these systems often embody variable binding, a notion that must be treated carefully at a computational level. This book aims to show that a programming language based on a simply typed version of higher-order logic provides an elegant, declarative means for providing such a treatment. Three broad topics are covered in pursuit of this goal. First, a proof-theoretic framework that supports a general view of logic programming is identified. Second, an actual language called λProlog is developed by applying this view to higher-order logic. Finally, a methodology for programming with specifications is exposed by showing how several computations over formal objects such as logical formulas, functional programs, and λ-terms and λ-calculus expressions can be encoded in λProlog.

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**The Practice of Prolog**
- Leon Sterling - 1990

Addressed to readers at different levels of programming expertise, The Practice of Prolog offers a departure from current books that focus on small programming examples requiring additional instruction in order to extend them to full programming projects. It shows how to design and organize moderate to large Prolog programs, providing a collection of eight programming projects, each with a particular application, and illustrating how a Prolog program was written to solve the application. These range from a simple learning program to designing a database for molecular biology to natural language generation from plans and stream data analysis. Leon Sterling is Associate Professor in the Department of Computer Engineering and Science at Case Western Reserve University. He is the coauthor, along with Ehud Shapiro, of The Art of Prolog. Contents: A Simple Learning Program, Richard O’Keefe. Designing a Prolog Database for Molecular Biology, Ewing Lusk, Robert Olson, Ross Overbeek, Steve Tucek, Parallelizing a Pascal Compiler, Eran Gabber. PREDITOR: A Prolog-Based VLSI Editor, Peter B. Reintjes. Assessing Register Transfer Level Hardware Design, Paul Drongowski. Design and Implementation of a Partial Evaluation System, Arun Lakhotia, Leon Sterling. Natural Language Generation from Plans, Chris Mellish. Stream Data Analysis in Prolog, Stott Parker.

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Formal Methods in Programming and Their Applications - Dines Bjørner - 1993-10-05
This volume comprises the papers selected for presentation at the international conference on Formal Methods in Programming and Their Applications, held in Academgorodok, Novosibirsk, Russia, June-July 1993. The conference was organized by the Institute of Informatics Systems of the Siberian Division of the Russian Academy of Sciences and was the first forum organized by the Institute which was entirely dedicated to formal methods. The main scientific tracks of the conference were centered around formal methods of program development and program construction. The papers in the book are grouped into the following parts: - formal semantics methods - algebraic specification methods - semantic program analysis and abstract interpretation - semantics of parallelism - logic of programs - software specification and verification - transformational development and program synthesis.

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Rule Technologies, Research, Tools, and Applications - Jose Julio Alferes - 2016-06-27
This book constitutes the refereed proceedings of the 10th International RuleML Symposium, RuleML 2016, held in New York, NY, USA during July 2016. The 19 full papers, 1 short paper, 2 keynote abstracts, 2 invited tutorial papers, 1 invited standard paper, presented were carefully reviewed and selected from 36 submissions. RuleML is a leading conference aimed to build bridges between academia and industry in the field of rules and its applications, especially as part of the semantic technology stack. It is production rule systems, logic programming rule engines, and business rule engines and business rule management systems, Semantic Web rule languages and rule standards and technologies, and research on inference rules, transformation rules, decision rules, and ECA rules.

Logic Programming and Its Applications - Michel van Cannehem - 1986
Logic programming is an emerging approach to computer science where programs are viewed as sets of logical axioms and computation is viewed as carefully controlled logical deduction. The approach currently finds practical realization in the programming language PROLOG. This volume contains details of research in the field, with a special emphasis on applications including expert systems, natural language parsing and analysis, database management and knowledge acquisition, circuit analysis, and hardware verification.

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Prolog Programming in Depth - Michael A. Covington - 1997
This text covers natural language processing in Prolog and presumes knowledge of Prolog, but not of linguistics. It includes simple but practical database query systems; covers syntax, formal semantics, and morphology; emphasizes working computer programs that implement subsystems of a natural language processor; features programs that are clearly designed and compatible with any Edinburgh-compatible prolog implementation (Quintas, ESL, Artsy, ALS etc.); and contains nearly 100 hands-on Prolog programming exercises and problem sets.

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**Prolog Programming and Applications** - 1985-11-11

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What sets this book apart from others on logic programming is the breadth of its coverage. The authors have achieved a fine balance between a clear and authoritative treatment of the theory and a practical, problem-solving approach to its applications. This edition introduces major new developments in a continually evolving field and includes such topics as concurrency and equational and constraint logic programming.

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**Implementations of Logic Programming Systems** - Evan Tick - 2012-12-06

This volume is a collection of research papers in the area of the implementation of logic programming systems, and it will be of immediate interest to practitioners who seek an understanding of how to efficiently manage memory, generate fast code, perform sophisticated static analyses, and design high-performance runtime features. A major theme throughout the book is how to effectively leverage host implementation systems and technologies to implement target systems. The book is also beneficial for future reference because it summarizes a wealth of systems implementation experience of the researchers shaping the field over the past ten years. Another theme of the book is compilation techniques to boost performance. The field of static analysis for logic programs is a rapidly developing field that deserves a volume on its own. Implementations of Logic Programming Systems is an excellent reference and may be used as a text for a course on the subject.

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**Declarative Logic Programming** - Michael Kifer - 2018-09-19

The idea of this book grew out of a symposium that was held at Stony Brook in September 2012 in celebration of David S.Warren’s fundamental contributions to Computer Science and the area of Logic Programming in particular. Logic Programming (LP) is at the nexus of Knowledge Representation, Artificial Intelligence, Mathematical Logic, Databases, and Programming Languages. It is fascinating and intellectually stimulating due brought about by logic. Logic programs are more declarative in the sense that they strive to be logical specifications of "what" to do rather than "how" to do it, and thus they are high-level and easier to understand and maintain. Yet, without being given an actual algorithm, LP systems implement the logical specifications automatically. Several books cover the basics of LP but focus mostly on the Prolog language with its incomplete control strategy and non-logical features. At the same time, there is generally a lack of accessible yet comprehensive collections of articles covering the key aspects in declarative LP. These aspects include, among others, well-founded vs. stable model semantics for negation, constraints, object-oriented LP, updates, probabilistic LP, and evaluation methods, including top-down vs. bottom-up, and tabling. For systems, the situation is even less satisfactory, lacking accessible literature that can help train the new crop of developers, practitioners, and researchers. There are a few guides onWarren’s Abstract Machine (WAM), which underlies most implementations of Prolog, but very little exists on what is needed for constructing a state-of-the-art declarative LP inference engine. Contrast this with the literature on, say, Compilers, where one can first study a book on the general principles and algorithms and then dive in the particulars of a specific compiler. Such resources greatly facilitate the ability to start making meaningful contributions quickly. There is also a dearth of articles about systems that support truly declarative languages, especially those that tie into first-order logic, mathematical programming, and constraint solving. LP helps solve challenging problems in a wide range of application areas, but in-depth analysis of their connection with LP language abstractions and LP implementation methods is lacking. Also, rare are surveys of challenging application areas of LP, such as Bioinformatics, Natural Language Processing, Verification, and Planning. The goal of this book is to help fill in the previously mentioned void in the LP literature. It offers a number of overviews on key aspects of LP that are suitable for researchers and practitioners as well as graduate students. The following chapters in theory, systems, and applications of LP are included.

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Logic as well. The first chapter is an easy to read non-technical Introduction to logic programming is a fascinating area in computer science, which held for years and still does - the promise of freeing oneself from programmings based on the "Von Neumann" machine. In addition computer programming has long been for solid theoretical foundations. While conventional engineering, dealing mainly with "analogue complexity", developed over some hundred years a complete body of mathematical tools, no such toolset was available for "digital complexity". The only mathematical discipline which deals with digital complexity is logic and Prolog is certainly the operational tool which comes closest to the logical programming ideal. So, why does Prolog, despite nearly twenty years of development, still appear to many today to be more of a research or academic tool, rather than an industrial programming language? A few reasons may explain this: First, I think Prolog suffers from having been largely assimilated into - and this followed the fate of - Artificial Intelligence. Much hype in the late 1980 created overexpectations and failed to deliver, and the counterreaction threw both AI and Prolog into relative obscurity. In a way, maybe this is a new chance for the Prolog community: the ability to carry out real work and progress without the disturbance of limelights and the unrealistic claims of various gurus. Second, programming in Prolog is a new experience for computer professionals.

Prolog: The Standard - Pierre Dernarsart - 2012-12-06
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Philosophical and Mathematical Logic - Harrie de Swart - 2018-11-28
This book was written to serve as an introduction to logic, with in each chapter - if applicable - special emphasis on the interplay between logic and philosophy, mathematics, language and (theoretical) computer science. The reader will not only be provided with an introduction to classical logic, but to philosophical (modal, epistemic, deontic, temporal) and intuitionistic to the topics in the book. The next chapters are consecutively about Propositional Logic, Sets (finite and infinite), Predicate Logic, Arithmetic and Gödel's Incompleteness Theorems, Modal Logic, Philosophy of Language, Intuitionism and Intuitionistic Logic, Applications (Prolog; Relational Databases and SQL; Social Choice Theory, in particular Majority Judgment) and finally, Fallacies and Unfair Discussion Methods. Throughout the text, the author provides some impressions of the historical development of logic. Logic programming is a wonderful book! Work written with all the necessary rigor, with immense depth, but without giving up clarity and good taste. Philosophy and mathematics go hand in hand with the most diverse themes of logic. An introductory text, but not only that. It goes much further. It’s worth diving into the pages of this book, dear reader!
typing, array processing, control structures functions, subroutines, user-defined types and pointers, pinpoints common problems that occur when programming, has sample output from a variety of compilers, expands on the first edition, by introducing modules as soon as the fundamental language features have been covered. Modules are the major organisational feature of Fortran and are the equivalent of classes in other languages, major new features covered in this edition include, introduction to object-oriented programming in Fortran introduction to parallel programming in Fortran using MPI, OpenMP and Coarray Fortra, this edition has three target audiences the complete beginner existing Fortran programmers wishing to update their code those with programming experience in other languages Ian Chivers and Jane Sleightholme are the joint owners of compfortran-90 which is a lively forum for the exchange of technical details of the Fortran language. Ian is the editor of the ACM Fortran Forum and both Jane and Ian have both been involved in the Fortran standardisation process. The authors have been teaching and supporting Fortran and related areas for over 30 years and their latest book reflects the lessons that have been learnt from this.

**Design Pattern Formalization Techniques** - Taibi, Toufik - 2007-04-30

Many formal approaches for pattern specification are emerging as a means to cope with the inherent shortcomings of informal description. Design Pattern Formalization Techniques presents multiple mathematical, formal approaches for pattern specification, emphasizing on software development processes for engineering disciplines. Design Pattern Formalization Techniques focuses on formalizing the solution element of patterns, providing tangible benefits to pattern users, researchers, scholars, academicians, practitioners and students working in the field of design patterns and software reuse. Design Pattern Formalization Techniques explains details of several specification languages, allowing readers to choose the most suitable formal technique to solve their specific inquiries.

**Machine Learning and Its Applications** - Georgios Palouras - 2001-08-01

In recent years machine learning has made its way from artificial intelligence into areas of administration, commerce, and industry. Data mining is perhaps the most widely known demonstration of this migration, complemented by generalized application learning like adaptive systems in industry, financial prediction, medical diagnosis and the construction of user profiles for Web browsers. This book presents the capabilities of machine learning methods and ideas on how these methods could be used to solve real-world problems. The first ten chapters assess the current state of the art of machine learning, from symbolic concept learning to cope with the inherent shortcomings of informal description. Design Pattern Formalization Techniques presents multiple mathematical, formal approaches for pattern specification, emphasizing on software development processes for engineering disciplines. Design Pattern Formalization Techniques focuses on formalizing the solution element of patterns, providing tangible benefits to pattern users, researchers, scholars, academicians, practitioners and students working in the field of design patterns and software reuse. Design Pattern Formalization Techniques explains details of several specification languages, allowing readers to choose the most suitable formal technique to solve their specific inquiries.

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**A Guide to Artificial Intelligence with Visual Prolog** - Randall Scott - 2001-08-01

Get started with the simplest, most powerful prolog ever: Visual Prolog If you want to explore the potential of Artificial Intelligence (AI), you need to know your way around Prolog. Prolog - which stands for "programming with logic" - is one of the most effective languages for building AI applications, thanks to its unique approach. Rather than writing a program that spells out exactly how to solve a problem, with Prolog you define a problem with logical Rules, and then set the computer loose on it. This paradigm shift from Procedural to Declarative programming makes Prolog ideal for applications involving AI, logic, language parsing, computational linguistics, and theorem-proving. Now, Visual Prolog (available as a free download) offers even more with its powerful Graphical User Interface (GUI), built-in Predicates, and rather large provided Program Foundation Class (PFC) libraries. A Guide to Artificial Intelligence with Visual Prolog is an excellent introduction to both Prolog and Visual Prolog. Designed for newcomers to Prolog with some conventional programming background (such as BASIC, C, C++, Pascal, etc.), Randall Scott proceeds along a logical, easy-to-grasp path as he explains the beginnings of Prolog, classic algorithms to get you started, and many of the unique features of Visual Prolog. Readers will also gain key insights into application development, application design, interface construction, troubleshooting, and more. In addition, there are numerous sample examples to learn from, copious illustrations and information on helpful resources. A Guide to Artificial Intelligence with Visual Prolog is less like a traditional textbook and more like a workshop where you can learn at your own pace - so you can start harnessing the power of Visual Prolog for whatever your mind can dream up.


Advances in Parallel Computing series presents the theory and use of parallel computer systems, including vector, pipeline, array, fifth and future generation computers and neural computers. This volume features original research work, as well as accounts on practical experience with and techniques for the use of parallel computers.

**Logic for Applications** - Anil Nerode - 2012-12-06

In writing this book, our goal was to produce a text suitable for a first course in mathematical logic for beginners with little or no previous exposure to logic and discrete mathematics. The book is intended for students of computer science and mathematics, and to be used as a first or second course in mathematical logic. The book is structured to be used as a textbook or as a reference book.
with the mathematical foundations of all three of these subjects. In addition, we include two chapters on nonclassical logic - modal and intuitionistic - that are becoming increasingly important in computer science. We develop the basic material on the syntax and semantics (via Kripke frames) for each of these logics. In both cases, our approach to formal proofs, soundness and completeness uses modifications of the same tableau method introduced for classical logic. We indicate how it can easily be adapted to various other special types of modal logic. A number of more advanced topics (including nonmonotonic logic) are also briefly introduced both in the nonclassical logic chapters and in the material on Logic Programming and PROLOG.

Logic for Applications - Anil Nerode - 2012-12-06
In writing this book, our goal was to produce a text suitable for a first course in mathematical logic more attuned than the traditional textbooks to the recent dramatic growth in the applications of logic to computer science. Thus our choice of topics has been heavily influenced by such applications. Of course, we cover the basic traditional topics - syntax, semantics, soundness, completeness and compactness - as well as a few more advanced results such as the theorems of Skolem-Lowenheim and Herbrand. Much of our book, however, deals with other less traditional topics. Resolution theorem proving plays a major role in our treatment of logic, especially in its application to Logic Programming and PROLOG. We deal extensively with the mathematical foundations of all three of these subjects. In addition, we include two chapters on nonclassical logic - modal and intuitionistic - that are becoming increasingly important in computer science. We develop the basic material on the syntax and semantics (via Kripke frames) for each of these logics. In both cases, our approach to formal proofs, soundness and completeness uses modifications of the same tableau method introduced for classical logic. We indicate how it can easily be adapted to various other special types of modal logics. A number of more advanced topics (including nonmonotonic logic) are also briefly introduced both in the nonclassical logic chapters and in the material on Logic Programming and PROLOG.

Learn Prolog Now! - Patrick Blackburn - 2006
Prolog is a programming language, but a rather unusual one. Prolog is short for Programming with Logic, and the link with logic gives Prolog its special character. At the heart of Prolog lies a surprising idea: don’t tell the computer what to do. Instead, describe situations of interest, and compute by asking questions. Prolog will logically deduce new facts about the situations and give its deductions back to us as answers. Why learn Prolog? For a start, its say what the problem is, rather than how to solve it stance, means that it is a very high level language, good for knowledge rich applications such as artificial intelligence, natural language processing, and the semantic web. So by studying Prolog, you gain insight into how sophisticated tasks can be handled computationally. Moreover, Prolog requires a different mindset. You have to learn to see problems from a new perspective, declaratively rather than procedurally. Acquiring this mindset, and learning to appreciate the links between logic and programming, makes the study of Prolog both challenging and rewarding. Learn Prolog Now! is a practical introduction to this fascinating language. Freely available as a web-book since 2002 (see www.learnprolognow.org) Learn Prolog Now! has become one of the most popular introductions to the Prolog programming language, an introduction prized for its clarity and down-to-earth approach. It is widely used as a textbook at university departments around the world, and even more widely used for self study. College Publications is proud to present here the first hard-copy version of this online classic. Carefully revised in the light of reader’s feedback, and now with answers to all the exercises, here you will find the essential material required to help you learn Prolog now.

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