

TEXTS AND MONOGRAPHS IN COMPUTER SCIENCE

# LARCH: LANGUAGES AND TOOLS FOR FORMAL SPECIFICATION

John V. Guttag/James J. Horning

with S.J. Garland, K.D. Jones, A. Madet, and J.M. Wing



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# Larch Languages And Tools For Formal Specification

**VHDL International. Users Forum**

## **Larch Languages And Tools For Formal Specification:**

Larch: Languages and Tools for Formal Specification John V. Guttag,James J. Horning,2012-12-06 Building software often seems harder than it ought to be It takes longer than expected the software's functionality and performance are not as wonderful as hoped and the software is not particularly malleable or easy to maintain It does not have to be that way This book is about programming and the role that formal specifications can play in making programming easier and programs better The intended audience is practicing programmers and students in undergraduate or basic graduate courses in software engineering or formal methods To make the book accessible to such an audience we have not presumed that the reader has formal training in mathematics or computer science We have however presumed some programming experience The roles of formal specifications Designing software is largely a matter of combining inventing and planning the implementation of abstractions The goal of design is to describe a set of modules that interact with one another in simple well defined ways If this is achieved people will be able to work independently on different modules and yet the modules will fit together to accomplish the larger purpose In addition during program maintenance it will be possible to modify a module without affecting many others Abstractions are intangible But they must somehow be captured and communicated That is what specifications are for Specification gives us a way to say what an abstraction is independent of any of its implementations

Larch: Languages and Tools for Formal Specification John V. Guttag,James J. Horning,1993-03-05 Building software often seems harder than it ought to be It takes longer than expected the software's functionality and performance are not as wonderful as hoped and the software is not particularly malleable or easy to maintain It does not have to be that way This book is about programming and the role that formal specifications can play in making programming easier and programs better The intended audience is practicing programmers and students in undergraduate or basic graduate courses in software engineering or formal methods To make the book accessible to such an audience we have not presumed that the reader has formal training in mathematics or computer science We have however presumed some programming experience The roles of formal specifications Designing software is largely a matter of combining inventing and planning the implementation of abstractions The goal of design is to describe a set of modules that interact with one another in simple well defined ways If this is achieved people will be able to work independently on different modules and yet the modules will fit together to accomplish the larger purpose In addition during program maintenance it will be possible to modify a module without affecting many others Abstractions are intangible But they must somehow be captured and communicated That is what specifications are for Specification gives us a way to say what an abstraction is independent of any of its implementations

**Specification of Software Systems** V.S. Alagar,K. Periyasamy,2013-03-14 This is a textbook on software specification emphasizing formal methods that are relevant to requirements and design stages of software development The aim of the book is to teach the fundamental principles of formal methods in the construction of modular and

verifiable formal specifications The book introduces several formal specification techniques and illustrates the expressive power of each technique with a number of examples General Characteristics Traditional textbooks on software engineering discuss the difficulties and challenges that lie on the path from requirements analysis to implementation of a software product Most of these books describe some techniques in detail and give hints on implementation of these techniques Only a few among them deal with important software engineering principles and techniques and discuss how a particular technique may be used to implement a given principle There is very little exposure in these books to a rigorous approach to or a systematic study of the construction of verifiable software Those who have acquired an understanding of the fundamental principles of software engineering from traditional textbooks will find the following characteristics of this book quite relevant to the practice of software engineering The book deals with specification The principal characteristic of this book is to discuss formalisms that provide a theoretical foundation for the principles of software engineering and are appropriate to the requirements and design stages of software development

*FM'99 - Formal Methods* Jeannette M. Wing, Jim Woodcock, Jim Davies, 2003-07-31 Formal methods are coming of age Mathematical techniques and tools are now regarded as an important part of the development process in a wide range of industrial and governmental organisations A transfer of technology into the mainstream of systems development is slowly but surely taking place FM 99 the First World Congress on Formal Methods in the Development of Computing Systems is a result and a measure of this new found maturity It brings an impressive array of industrial and applications oriented papers that show how formal methods have been used to tackle real problems These proceedings are a record of the technical symposium of FM 99 also side the papers describing applications of formal methods you will find technical reports papers and abstracts detailing new advances in formal techniques from mathematical foundations to practical tools The World Congress is the successor to the four Formal Methods Europe Symposia which in turn succeeded the four VDM Europe Symposia This session reflects an increasing openness within the international community of researchers and practitioners papers were submitted covering a wide variety of formal methods and application areas The programme committee reflects the Congress's international nature with a membership of 84 leading researchers from 38 different countries The committee was divided into 19 tracks each with its own chair to oversee the reviewing process Our collective task was a difficult one there were 259 high quality submissions from 35 different countries

Encyclopedia of Computer Science and Technology Allen Kent, James G. Williams, 1998-02-18 Algorithms for Designing Multimedia Storage Servers to Models and Architectures

**ZUM '95: The Z Formal Specification Notation** Jonathan P. Bowen, 1995-08-23 This book presents the proceedings of the 9th International Conference of Z Users ZUM 95 held in Limerick Ireland in September 1995 The book contains 34 carefully selected papers on Z using Z applications of Z proof testing industrial usage object orientation animation of specification method integration and teaching formal methods Of particular interest is the inclusion of an annotated Z bibliography listing 544 entries While focussing on Z by far the most commonly used formal

method both in industry and application the volume is of high relevance for the whole formal methods community

**Formal Description Techniques** ,1996    **Technology of Object-oriented Languages, TOOLS 24** Jian Chen,1998

This volume covers topics including performance evaluation of objects with roles design of flexible class library management systems assembling software with the reusable components in a library and object oriented technology transfer to multiprocessor system level synthesis    **Algebraic Methodology and Software Technology** ,2002    **ACM SIGPLAN Notices** ,2006

**Proceedings** ,1997 Metrics and quality assurance knowledge and logic based systems object orientated techniques validation and verification distributed and mobile systems software design methodology software process user interaction and testing software are some of the areas examined in this book    **Object-oriented Technology** ,1999

*Sixth International Conference on Tools with Artificial Intelligence* ,1994    **1998 Asia Pacific Software Engineering Conference** ,1998 Partial Contents Architecture Framework Formal Methods Metrics Software Design Methodology

Validation UML Software Development Environment Object Oriented Techniques Distributed User Interface    **SIGSOFT '95**

Gail E. Kaiser,1995    **TAPSOFT '93** Marie-Claude Gaudel,Jean-Pierre Jouannaud,1993 This volume contains the

proceedings of the fourth International Joint Conference on the Theory and Practice of Software Development TAPSOFT 93

Since the first in 1985 the aim of these conferences has been to bring together theoretical computer scientists and researchers in software engineering with a view to discussing how formal methods can usefully be applied in software development TAPSOFT 93 consists of three parts an advanced seminar the Colloquium on Trees in Algebra and Programming CAAP and the Colloquium on Formal Approaches of Software Engineering FASE The advanced seminar includes four invited surveys and four invited conferences The selected papers for CAAP are organized in seven sessions specifications and proofs concurrency automata and counting constraints solving rewriting logic and trees analysis of algorithms and a common session with FASE on type inference The selected papers for FASE are presented in eight sessions case studies in formal design and development compositionality modules and development formal development foundations and analysis of formal specifications verification of concurrent systems model checking parallel calculus and a common session with CAAP on type inference PUBLISHER S WEBSITE    *Tools and Algorithms for the Construction and Analysis of Systems* ,1998

Predictably Dependable Computing Systems Brian Randell,Jean-Claude Laprie,Hermann Kopetz,Bev Littlewood,2013-11-11    Proceedings VHDL International. Users Forum,1997    **ECOOP ...** ,2004

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