

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. Modet, and J.M. Wing



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# Larch Languages And Tools For Formal Specification

**Hakan Erdogmus, Tao Weng**



## **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, 2012-01-25 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 **ZUM ... the Z Formal Specification Notation** ,1995

Encyclopedia of Computer Science and Technology Allen Kent,James G. Williams,1998-02-18 Algorithms for Designing Multimedia Storage Servers to Models and Architectures *Cryptographic Security Architecture* Peter Gutmann,2007-05-08 A cryptographic security architecture is the collection of hardware and software that protects and controls the use of encryption keys and similar cryptovariables It is the foundation for enforcing computer security policies and controls and preempting system misuse This book provides a comprehensive design for a portable flexible high security cryptographic architecture with particular emphasis on incorporating rigorous security models and practices Cryptographic Security Architecture unveils an alternative means of building a trustworthy system based on concepts from established software engineering principles and cognitive psychology Its novel security kernel design implements a reference monitor that controls access to security relevant objects and attributes based on a configurable security policy Topics and features Builds a concise architectural design that can be easily extended in the future Develops an application specific security kernel that enforces a fully customizable rule based security policy Presents a new verification technique that allows verification from the high level specification down to the running code Describes effective security assurance in random number generation and the pitfalls associated therewith Examines the generation and protection of cryptovariables as well as application of the architectural design to cryptographic hardware The work provides an in depth presentation of a flexible platform independent cryptographic security architecture suited to software hardware and hybrid implementations Security design practitioners professionals researchers and advanced students will find the work an essential resource Formal Description Techniques ,1996 **Formal Description Techniques IX** R. Gotzhein,J. Brederke,1996-09-30 This book is the combined proceedings of the latest IFIP Formal Description Techniques FDTs and Protocol Specification Testing and Verification PSTV series It addresses FDTs applicable to communication protocols and distributed systems with special

emphasis on standardised FDTs It features state of the art in theory application tools and industrialisation of formal description

**COTS-Based Software Systems** Hakan Erdogmus,Tao Weng,2003-07-01 This book constitutes the refereed proceedings of the Second International Conference on COTS Based Software Systems ICCBSS 2003 held in Ottawa Canada in February 2003 The 24 revised full papers presented were carefully reviewed and selected from numerous submissions The papers address all current issues on commercial off the shelf systems from the point of view of research and development as well as from the practitioner s application point of view

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**Proceedings, 11th IEEE International Conference and Workshop on the Engineering of Computer-Based Systems** Vaclav Dvorak,Miroslav Sveda,2004

**Recent Trends in Data Type Specification** ,1996

**OOPSLA '97 : Object Technology, Naturally** ,1997

ACM SIGPLAN Notices ,2006

**Software Engineering** Ian Sommerville,2004 This book discusses a comprehensive spectrum of software engineering techniques and shows how they can be applied in practical software projects This edition features updated chapters on critical systems project management and software requirements

**Algebraic Methodology and Software Technology** ,2002

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