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Nota di contenuto	Verified Software: Theories, Tools, Experiments Vision of a Grand Challenge Project -- Verification Tools -- Towards a Worldwide Verification Technology -- It Is Time to Mechanize Programming Language Metatheory -- Methods and Tools for Formal Software Engineering -- Guaranteeing Correctness -- The Verified Software Challenge: A Call for a Holistic Approach to Reliability -- A Mini Challenge: Build a Verifiable Filesystem -- A Constructive Approach to Correctness, Exemplified by a Generator for Certified Java Card Applets

-- Some Interdisciplinary Observations about Getting the "Right" Specification -- Software Engineering Aspects -- Software Verification and Software Engineering a Practitioner's Perspective -- Decomposing Verification Around End-User Features -- Verifying Object-Oriented Programming -- Automatic Verification of Strongly Dynamic Software Systems -- Reasoning about Object Structures Using Ownership -- Modular Reasoning in Object-Oriented Programming -- Scalable Specification and Reasoning: Challenges for Program Logic -- Programming Language and Methodology Aspects -- Lessons from the JML Project -- The Spec# Programming System: Challenges and Directions -- Integrating Static Checking and Interactive Verification: Supporting Multiple Theories and Provers in Verification -- Components -- Automated Test Generation and Verified Software -- Dependent Types, Theorem Proving, and Applications for a Verifying Compiler -- Generating Programs Plus Proofs by Refinement -- Static Analysis -- The Verification Grand Challenge and Abstract Interpretation -- WYSINWYX: What You See Is Not What You eXecute -- Implications of a Data Structure Consistency Checking System -- Towards the Integration of Symbolic and Numerical Static Analysis -- Design, Analysis and Tools -- Reliable Software Systems Design: Defect Prevention, Detection, and Containment -- Trends and Challenges in Algorithmic Software Verification -- Model Checking: Back and Forth between Hardware and Software -- Computational Logical Frameworks and Generic Program Analysis Technologies -- Formal Techniques -- A Mechanized Program Verifier -- Verifying Design with Proof Scores -- Integrating Theories and Techniques for Program Modelling, Design and Verification -- Eiffel as a Framework for Verification -- Position Papers -- Can We Build an Automatic Program Verifier? Invariant Proofs and Other Challenges -- Verified Software: The Real Grand Challenge -- Linking the Meaning of Programs to What the Compiler Can Verify -- Scalable Software Model Checking Using Design for Verification -- Model-Checking Software Using Precise Abstractions -- Toasters, Seat Belts, and Inferring Program Properties -- On the Formal Development of Safety-Critical Software -- Verify Your Runs -- Specified Blocks -- A Case for Specification Validation -- Some Verification Issues at NASA Goddard Space Flight Center -- Performance Validation on Multicore Mobile Devices -- Tool Integration for Reasoned Programming -- Decision Procedures for the Grand Challenge -- The Challenge of Hardware-Software Co-verification -- From the How to the What -- An Overview of Separation Logic -- A Perspective on Program Verification -- Meta-Logical Frameworks and Formal Digital Libraries -- Languages, Ambiguity, and Verification -- The Importance of Non-theorems and Counterexamples in Program Verification -- Regression Verification - A Practical Way to Verify Programs -- Programming with Proofs: Language-Based Approaches to Totally Correct Software -- The Role of Model-Based Testing -- Abstraction of Graph Transformation Systems by Temporal Logic and Its Verification -- Program Verification by Using DISCOVERER -- Constraint Solving and Symbolic Execution.

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## Sommario/riassunto

This state-of-the-art survey is an outcome of the first IFIP TC 2/WG 2.3 working conference on Verified Software: Theories, Tools, Experiments, VSTTE 2005, held in Zurich, Switzerland, in October 2005. This was a historic event gathering many top international experts on systematic methods for specifying, building and verifying high-quality software. The book includes 32 revised full papers and 27 revised position papers, preceded by a general introduction to the area, which also presents the vision of a grand challenge project: the "verifying compiler". Most contributions are followed by a transcription of the vivid discussion that ensued between the author and the audience. The

papers have been organized in topical sections on verification tools, guaranteeing correctness, software engineering aspects, verifying object-oriented programming, programming language and methodology aspects, components, static analysis, design, analysis and tools, as well as formal techniques.

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