Record Nr. UNINA9910138863203321 Static analysis of software [[electronic resource]]: the abstract **Titolo** interpretation / / edited by Jean-Louis Boulanger Pubbl/distr/stampa Hoboken, N.J.,: Wiley, 2012 **ISBN** 1-118-60286-2 1-118-60295-1 1-118-60284-6 1-299-18778-1 Descrizione fisica 1 online resource (347 p.) Collana **ISTE** Altri autori (Persone) BoulangerJean-Louis Disciplina 005.1/4 Soggetti Computer software - Testing Debugging in computer science Computer software - Quality control Electronic books. Lingua di pubblicazione Inglese **Formato** Materiale a stampa Livello bibliografico Monografia Description based upon print version of record. Note generali Nota di bibliografia Includes bibliographical references and index. Nota di contenuto Cover; Title Page; Copyright Page; Table of Contents; Introduction; Chapter 1. Formal Techniques for Verification and Validation: 1.1. Introduction; 1.2. Realization of a software application; 1.3. Characteristics of a software application; 1.4. Realization cycle; 1.4.1. Cycle in V and other realization cycles; 1.4.2. Quality control (the impact of ISO standard 9001); 1.4.3. Verification and validation; 1.5. Techniques, methods and practices; 1.5.1. Static verification; 1.5.2. Dynamic verification; 1.5.3. Validation; 1.6. New issues with verification and validation; 1.7. Conclusion 1.8. BibliographyChapter 2. Airbus: Formal Verification in Avionics; 2.1. Industrial context; 2.1.1. Avionic systems; 2.1.2. A few examples: 2.1.3. Regulatory framework; 2.1.4. Avionic functions; 2.1.5. Development of avionics levels; 2.2. Two methods for formal verification; 2.2.1. General principle of program proof; 2.2.2. Static analysis by abstract interpretation; 2.2.3. Program proof by calculation of the weakest precondition; 2.3. Four formal verification tools; 2.3.1. Caveat; 2.3.2. Proof of the absence of run-time errors: Astree; 2.3.3.

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Sommario/riassunto

The existing literature currently available to students and researchers is very general, covering only the formal techniques of static analysis. This book presents real examples of the formal techniques called ""abstract interpretation"" currently being used in various industrial fields: railway, aeronautics, space, automotive, etc. The purpose of this book is to present students and researchers, in a single book, with the wealth of experience of people who are intrinsically involved in the realization and evaluation of software-based safety critical systems. As the authors are people curr