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| 1. Record Nr. | UNINA9910298989403321 |
| Autore | Nipkow Tobias |
| Titolo | Concrete Semantics : With Isabelle/HOL // by Tobias Nipkow, Gerwin Klein |
| Pubbl/distr/stampa | Cham : , : Springer International Publishing : , : Imprint : Springer, , 2014 |
| ISBN | 3-319-10542-6 |
| Edizione | [1st ed. 2014.] |
| Descrizione fisica | 1 online resource (XIII, 298 p. 87 illus., 1 illus. in color.) |
| Disciplina | 005.1015113 |
| Soggetti | Computer logic Programming languages (Electronic computers) Mathematical logic Logics and Meanings of Programs Programming Languages, Compilers, Interpreters Mathematical Logic and Formal Languages |
| Lingua di pubblicazione | Inglese |
| Formato | Materiale a stampa |
| Livello bibliografico | Monografia |
| Note generali | Bibliographic Level Mode of Issuance: Monograph |
| Nota di contenuto | Introduction -- Programming and Proving -- Case Study: IMP Expressions -- Logic and Proof Beyond Equality -- Isar: A Language for Structured Proofs -- IMP: A Simple Imperative Language -- Compiler -- Types -- Program Analysis -- Denotational Semantics -- Hoare Logic -- Abstract Interpretation -- App. A, Auxiliary Definitions -- App. B, Symbols -- References. |
| Sommario/riassunto | Part I of this book is a practical introduction to working with the Isabelle proof assistant. It teaches you how to write functional programs and inductive definitions and how to prove properties about them in Isabelle's structured proof language. Part II is an introduction to the semantics of imperative languages with an emphasis on applications like compilers and program analysers. The distinguishing feature is that all the mathematics has been formalised in Isabelle and much of it is executable. Part I focusses on the details of proofs in Isabelle; Part II can be read even without familiarity with Isabelle's proof language, all proofs are described in detail but informally. The book teaches the reader the art of precise logical reasoning and the practical |

use of a proof assistant as a surgical tool for formal proofs about computer science artefacts. In this sense it represents a formal approach to computer science, not just semantics. The Isabelle formalisation, including the proofs and accompanying slides, are freely available online, and the book is suitable for graduate students, advanced undergraduate students, and researchers in theoretical computer science and logic.
