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| Autore                  | Mouheb Djedjiga                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Titolo                  | Aspect-Oriented Security Hardening of UML Design Models // by Djedjiga Mouheb, Mourad Debbabi, Makan Pourzandi, Lingyu Wang, Mariam Nouh, Raha Ziarati, Dima Alhadidi, Chamseddine Talhi, Vitor Lima                                                                                                                                                                                                                                                                                                                                                    |
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| Edizione                | [1st ed. 2015.]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Descrizione fisica      | 1 online resource (247 p.)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Disciplina              | 004<br>005.1<br>005.8                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Soggetti                | Software engineering<br>Data protection<br>Software Engineering<br>Data and Information Security                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Lingua di pubblicazione | Inglese                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
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| Note generali           | Description based upon print version of record.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Nota di bibliografia    | Includes bibliographical references and index.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Nota di contenuto       | 1 Introduction -- 2 Unified Modeling Language -- 3 Aspect-Oriented Paradigm -- 4 Model-Driven Architecture and Model Transformations -- 5 Model-Based Security -- 6 Security Aspect Specification -- 7 Security Aspect Weaving -- 8 Static Matching and Weaving Semantics in Activity Diagrams -- 9 Dynamic Matching and Weaving Semantics in k-Calculus -- 10 Dynamic Matching and Weaving Semantics in Executable UML -- 11 Conclusion.                                                                                                               |
| Sommario/riassunto      | This book comprehensively presents a novel approach to the systematic security hardening of software design models expressed in the standard UML language. It combines model-driven engineering and the aspect-oriented paradigm to integrate security practices into the early phases of the software development process. To this end, a UML profile has been developed for the specification of security hardening aspects on UML diagrams. In addition, a weaving framework, with the underlying theoretical foundations, has been designed for the |

systematic injection of security aspects into UML models. The work is organized as follows: chapter 1 presents an introduction to software security, model-driven engineering, UML and aspect-oriented technologies. Chapters 2 and 3 provide an overview of UML language and the main concepts of aspect-oriented modeling (AOM) respectively. Chapter 4 explores the area of model-driven architecture with a focus on model transformations. The main approaches that are adopted in the literature for security specification and hardening are presented in chapter 5. After these more general presentations, chapter 6 introduces the AOM profile for security aspects specification. Afterwards, chapter 7 details the design and the implementation of the security weaving framework, including several real-life case studies to illustrate its applicability. Chapter 8 elaborates an operational semantics for the matching/weaving processes in activity diagrams, while chapters 9 and 10 present a denotational semantics for aspect matching and weaving in executable models following a continuation-passing style. Finally, a summary and evaluation of the work presented are provided in chapter 11. The book will benefit researchers in academia and industry as well as students interested in learning about recent research advances in the field of software security engineering.

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