

## Domain Specific Languages Addison Wesley Signature

This book constitutes the refereed proceedings of the Third International Conference on Future Data and Security Engineering, FDSE 2016, held in Can Tho City, Vietnam, in November 2016. The 28 revised full papers and 7 short papers presented were carefully reviewed and selected from 128 submissions. The accepted papers were grouped into the following sessions: Advances in query processing and optimization Big data analytics and applications Blockchains and emerging authentication techniques Data engineering tools in software development Data protection, data hiding, and access control Internet of Things and applications Security and privacy engineering Social network data analytics and recommendation systems

This book constitutes the refereed proceedings of the First EurAsian Conference on Information and Communication Technology, EurAsia-ICT 2002, held in Shiraz, Iran, in October 2002. The 116 revised full papers presented were carefully reviewed and selected from more than 300 submissions. The papers are organized in topical sections on artificial intelligence, data mining, multimedia, security, neural networks, data and knowledge engineering, XML, mobile communication, computer graphics, digital libraries, natural language processing, Internet and QoS, information society, e-learning, mobile Web information systems, wireless communications, Web-based applications, intelligent agents, real-time systems, software engineering, algorithms, and theoretical computer science. This book shows developers how to reduce development costs by building custom tools for maximum flexibility and efficiency.

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The papers of this volume focus on the foundational aspects of computer science, the thematic origin and stronghold of LNCS, under the title “Computing and Software Science: State of the Art and Perspectives”. They are organized in two parts: The first part, Computation and Complexity, presents a collection of expository papers on fashionable themes in algorithmics, optimization, and complexity. The second part, Methods, Languages and Tools for Future System Development, aims at sketching the methodological evolution that helps guaranteeing that future systems meet their increasingly critical requirements. Chapter 3 is available open access under a Creative Commons Attribution 4.0 International License via [link.springer.com](http://link.springer.com). This book constitutes the proceedings of the 10th European Conference on Modelling Foundations and Applications, ECMFA 2014, held as part of STAF 2014, in York, UK, in July 2014. The 14 foundation track papers and the 3 applications track papers presented in this volume were carefully reviewed and selected from 58 submissions. They are on all aspects of MDE, including topics such as model provenance; model transformations and code generation; model synthesis; model-driven testing; formal modeling approaches; business modeling; and usability of models.

This tutorial volume includes revised and extended lecture notes of six long tutorials, five short tutorials, and one peer-reviewed participant contribution held at the 4th International Summer School on Generative and Transformational Techniques in Software Engineering, GTTSE 2011. The school presents the state of the art in software language engineering and generative and transformational techniques in software engineering with coverage of foundations, methods, tools, and case studies.

"This book presents current research on all aspects of domain-specific language for scholars

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and practitioners in the software engineering fields, providing new results and answers to open problems in DSL research"--

Real-Time Simulation Technologies: Principles, Methodologies, and Applications is an edited compilation of work that explores fundamental concepts and basic techniques of real-time simulation for complex and diverse systems across a broad spectrum. Useful for both new entrants and experienced experts in the field, this book integrates coverage of detailed theory, acclaimed methodological approaches, entrenched technologies, and high-value applications of real-time simulation—all from the unique perspectives of renowned international contributors. Because it offers an accurate and otherwise unattainable assessment of how a system will behave over a particular time frame, real-time simulation is increasingly critical to the optimization of dynamic processes and adaptive systems in a variety of enterprises. These range in scope from the maintenance of the national power grid, to space exploration, to the development of virtual reality programs and cyber-physical systems. This book outlines how, for these and other undertakings, engineers must assimilate real-time data with computational tools for rapid decision making under uncertainty. Clarifying the central concepts behind real-time simulation tools and techniques, this one-of-a-kind resource: Discusses the state of the art, important challenges, and high-impact developments in simulation technologies Provides a basis for the study of real-time simulation as a fundamental and foundational technology Helps readers develop and refine principles that are

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applicable across a wide variety of application domains As science moves toward more advanced technologies, unconventional design approaches, and unproven regions of the design space, simulation tools are increasingly critical to successful design and operation of technical systems in a growing number of application domains. This must-have resource presents detailed coverage of real-time simulation for system design, parallel and distributed simulations, industry tools, and a large set of applications. This supplement covers topics ranging from academic library funding to visual information querying.

Martin Fowler's breakthrough practitioner-oriented book on Domain Specific Languages - will do for DSLs what Fowler did for refactoring! \* \*Fowler's highly anticipated introduction to DSLs: a category-defining book by one of the software world's most influential authors. \*Two books in one: a concise narrative that introduces DSLs, and a larger reference that shows how to plan and develop them. \*Helps software professionals reduce the cost and complexity of building DSLs - so they can take full advantage of them. Domain Specific Languages (DSLs) offer immense promise for software engineers who need better, faster ways to solve problems of specific types, or in specific areas or industries. DSLs have been around for several years, and have begun to grow in popularity. Now, Martin Fowler - one of the world's most influential software engineering authors - has written the first practitioner-oriented book about them. Fowler's legendary book, Refactoring, made software refactoring a crucial tool for

software engineers worldwide; this book will do the same for DSLs. Fowler has designed Domain Specific Languages as two books in one. The first --a narrative designed to be read from 'cover to cover' - offers a concise introduction to DSLs, how they are implemented, and what are useful for. Next, Fowler thoroughly introduces today's most effective techniques for building DSLs. Fowler covers both 'external' and 'internal' DSLs, as well as alternative computational models, code generation, common parser topics, and much more. He provides extensive Java and C# examples throughout, as well as selected Ruby examples for concepts that can best be explained using a dynamic language. Together, both sections enable readers to make wellinformed choices about whether to use a DSL in their work, and which techniques to employ in order to build DSLs more quickly and cost-effectively.

The book begins with an overview of the domain of language workbenches, which provides perspectives and motivations underpinning the creation of MPS. Moreover, technical details of the language underneath MPS together with the definition of the tool's main features are discussed. The remaining ten chapters are then organized in three parts, each dedicated to a specific aspect of the topic. Part I "MPS in Industrial Applications" deals with the challenges and inadequacies of general-purpose languages used in companies, as opposed to the reasons why DSLs are essential, together with their benefits and efficiency, and summarizes lessons learnt by using MPS. Part II about "MPS in Research Projects" covers the benefits of text-based

languages, the design and development of gamification applications, and research fields with generally low expertise in language engineering. Eventually, Part III focuses on “Teaching and Learning with MPS” by discussing the organization of both commercial and academic courses on MPS.

This book constitutes the thoroughly refereed post-proceedings of the Third International Conference on Software Language Engineering, SLE 2010, held in Eindhoven, The Netherlands, in October 2010. The 24 papers presented were carefully reviewed and selected from 79 submissions. The book also contains the abstracts of two invited talks. The papers are grouped in topical sections on grammarware, metamodeling, evolution, programming, and domain-specific languages. The short papers and demos included deal with modeling and transformations and translations. Learn how to implement a DSL with Xtext and Xtend using easy-to-understand examples and best practices About This Book Leverage the latest features of Xtext and Xtend to develop a domain-specific language. Integrate Xtext with popular third party IDEs and get the best out of both worlds. Discover how to test a DSL implementation and how to customize runtime and IDE aspects of the DSL Who This Book Is For This book is targeted at programmers and developers who want to create a domain-specific language with Xtext. They should have a basic familiarity with Eclipse and its functionality. Previous experience with compiler implementation can be helpful but is not necessary since this book will explain all the development stages of a DSL. What

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You Will Learn Write Xtext grammar for a DSL; Use Xtend as an alternative to Java to write cleaner, easier-to-read, and more maintainable code; Build your Xtext DSLs easily with Maven/Tycho and Gradle; Write a code generator and an interpreter for a DSL; Explore the Xtext scoping mechanism for symbol resolution; Test most aspects of the DSL implementation with JUnit; Understand best practices in DSL implementations with Xtext and Xtend; Develop your Xtext DSLs using Continuous Integration mechanisms; Use an Xtext editor in a web application In Detail Xtext is an open source Eclipse framework for implementing domain-specific languages together with IDE functionalities. It lets you implement languages really quickly; most of all, it covers all aspects of a complete language infrastructure, including the parser, code generator, interpreter, and more. This book will enable you to implement Domain Specific Languages (DSL) efficiently, together with their IDE tooling, with Xtext and Xtend. Opening with brief coverage of Xtext features involved in DSL implementation, including integration in an IDE, the book will then introduce you to Xtend as this language will be used in all the examples throughout the book. You will then explore the typical programming development workflow with Xtext when we modify the grammar of the DSL. Further, the Xtend programming language (a fully-featured Java-like language tightly integrated with Java) will be introduced. We then explain the main concepts of Xtext, such as validation, code generation, and customizations of runtime and UI aspects. You will have learned how to test a DSL implemented in Xtext with JUnit and

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will progress to advanced concepts such as type checking and scoping. You will then integrate the typical Continuous Integration systems built in to Xtext DSLs and familiarize yourself with Xbase. By the end of the book, you will manually maintain the EMF model for an Xtext DSL and will see how an Xtext DSL can also be used in IntelliJ. Style and approach A step-by step-tutorial with illustrative examples that will let you master using Xtext and implementing DSLs with its custom language, Xtend. Using Domain Specific Languages (DSLs), you can solve a wide spectrum of problems more rapidly and effectively than ever before. However, early adopters have struggled with the absence of sophisticated IDE tools for their new languages. Eclipse Xtext solves this problem, offering complete infrastructure for your DSLs -- from parsers, linkers, compilers, and interpreters to developer productivity features like validation and code completion. Now, for the first time, there's a comprehensive guide to developing industry-strength DSL projects with Xtext. Creating Domain-Specific Languages with Eclipse Xtext covers all you need to know to succeed with the widely-anticipated new Xtext 2 release. You'll learn: How Xtext works and how it relates to other Eclipse frameworks How to create your own DSLs with Xtext How to implement custom DSL editors that maximize user productivity How to write Xtext grammars for existing (legacy) DSLs How to integrate Xtext DSLs with other EMF models and Eclipse-based technologies How to solve "industrial-strength" problems, including scalability of large grammars and models; advanced customization; and proper build and continuous

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integration set-up Xtext 2.0 isn't just another DSL creation tool: it's a breakthrough enabler that will bring DSLs into far wider usage. This guide will help you get results with Xtext 2.0 fast - whether you're just started working with DSLs or you've been pioneering them for years.

This book discusses smart, agile software development methods and their applications for enterprise crisis management, presenting a systematic approach that promotes agility and crisis management in software engineering. The key finding is that these crises are caused by both technology-based and human-related factors. Being mission-critical, human-related issues are often neglected. To manage the crises, the book suggests an efficient agile methodology including a set of models, methods, patterns, practices and tools. Together, these make a survival toolkit for large-scale software development in crises. Further, the book analyses lifecycles and methodologies focusing on their impact on the project timeline and budget, and incorporates a set of industry-based patterns, practices and case studies, combining academic concepts and practices of software engineering.

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The three-volume set LNCS 12762, 12763, and 12764 constitutes the refereed proceedings of the Human Computer Interaction thematic area of the 23rd International Conference on Human-Computer Interaction, HCII 2021, which took place virtually in July 2021. The total of 1276 papers and 241 posters included in the 39 HCII 2021

proceedings volumes was carefully reviewed and selected from 5222 submissions. The 139 papers included in this HCI 2021 proceedings were organized in topical sections as follows: Part I, Theory, Methods and Tools: HCI theory, education and practice; UX evaluation methods, techniques and tools; emotional and persuasive design; and emotions and cognition in HCI Part II, Interaction Techniques and Novel Applications: Novel interaction techniques; human-robot interaction; digital wellbeing; and HCI in surgery Part III, Design and User Experience Case Studies: Design case studies; user experience and technology acceptance studies; and HCI, social distancing, information, communication and work

This book constitutes the refereed proceedings of the 4th International Conference on Simulation, Modeling, and Programming for Autonomous Robots, SIMPAR 2014, held in Bergamo, Italy, in October 2014. The 49 revised full papers presented were carefully reviewed and selected from 62 submissions. The papers are organized in topical sections on simulation, modeling, programming, architectures, methods and tools, and systems and applications.

Dijkstra once wrote that computer science is no more about computers than astronomy is about telescopes. Despite the many incredible advances in computer science from times that predate practical mechanical computing, there is still a myriad of fundamental questions in understanding the interface between computers and the rest of the world. Why is it still hard to mechanize many tasks that seem to be fundamentally routine,

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even as we see ever-increasing capacity for raw mechanical computing? The disciplined study of domain-specific languages (DSLs) is an emerging area in computer science, and is one which has the potential to revolutionize the field, and bring us closer to answering this question. DSLs are formalisms that have four general characteristics. – They relate to a well-defined domain of discourse, be it controlling traffic lights or space ships. – They have well-defined notation, such as the ones that exist for prescribing music, dance routines, or strategy in a football game. – The informal or intuitive meaning of the notation is clear. This can easily be overlooked, especially since intuitive meaning can be expressed by many different notations that may be received very differently by users. – The formal meaning is clear and mechanizable, as is, hopefully, the case for the instructions we give to our bank or to a merchant online. This book contains the thoroughly refereed technical papers presented in six workshops collocated with the International Conference on Software Technologies: Applications and Foundations, STAF 2017, held in Marburg, Germany, in July 2017. The 15 full and 22 short papers presented were carefully reviewed and selected from 37 submissions. The events whose papers are included in this volume are: BigMDE 2017: 5th International Workshop on Scalable Model Driven Engineering GCM 2017: 8th International Workshop on Graph Computation Models GRAND 2017: 1st International Workshop on Grand Challenges in Modeling MORSE 2017: 4th International Workshop on Model-driven Robot Software Engineering OCL 2017: 17th

International Workshop in OCL and Textual Modeling STAF Projects Showcase 2017: 3rd event dedicated to international and national project dissemination and cooperation Innovative tools and techniques for the development and design of software systems are essential to the problem solving and planning of software solutions. Software Design and Development: Concepts, Methodologies, Tools, and Applications brings together the best practices of theory and implementation in the development of software systems. This reference source is essential for researchers, engineers, practitioners, and scholars seeking the latest knowledge on the techniques, applications, and methodologies for the design and development of software systems. The two-volume set LNCS 10271 and 10272 constitutes the refereed proceedings of the 19th International Conference on Human-Computer Interaction, HCII 2017, held in Vancouver, BC, Canada, in July 2017. The total of 1228 papers presented at the 15 colocated HCII 2017 conferences was carefully reviewed and selected from 4340 submissions. The papers address the latest research and development efforts and highlight the human aspects of design and use of computing systems. They cover the entire field of Human-Computer Interaction, addressing major advances in knowledge and effective use of computers in a variety of application areas. The papers included in this volume cover the following topics: HCI theory and education; HCI, innovation and technology acceptance; interaction design and evaluation methods; user interface development; methods, tools, and architectures; multimodal interaction; and emotions

in HCI.

In a globalized society, effective communication is critical, and study of language from a mathematical perspective can shed light on new ways in which to express meaning across cultures and nations. *Computational Linguistics: Concepts, Methodologies, Tools, and Applications* explores language by dissecting the phonemic aspects of various communication systems in order to identify similarities and pitfalls in the expression of meaning. With applications in a variety of areas, from psycholinguistics and cognitive science to computer science and artificial intelligence, this multivolume reference work will be of use to researchers, professionals, and educators on the cutting edge of language acquisition and communication science.

This book is Open Access under a CC BY licence. This book constitutes the proceedings of the 22nd International Conference on Fundamental Approaches to Software Engineering, FASE 2019, which took place in Prague, Czech Republic in April 2019, held as Part of the European Joint Conferences on Theory and Practice of Software, ETAPS 2019. The 24 papers presented in this volume were carefully reviewed and selected from 94 submissions. The papers are organized in topical sections named: software verification; model-driven development and model transformation; software evolution and requirements engineering; specification, design, and implementation of particular classes of systems; and software testing.

This book details the conceptual foundations, design and implementation of the domain-

specific language (DSL) development system DjDSL. DjDSL facilitates design-decision-making on and implementation of reusable DSL and DSL-product lines, and represents the state-of-the-art in language-based and composition-based DSL development. As such, it unites elements at the crossroads between software-language engineering, model-driven software engineering, and feature-oriented software engineering. The book is divided into six chapters. Chapter 1 (“DSL as Variable Software”) explains the notion of DSL as variable software in greater detail and introduces readers to the idea of software-product line engineering for DSL-based software systems. Chapter 2 (“Variability Support in DSL Development”) sheds light on a number of interrelated dimensions of DSL variability: variable development processes, variable design-decisions, and variability-implementation techniques for DSL. The three subsequent chapters are devoted to the key conceptual and technical contributions of DjDSL: Chapter 3 (“Variable Language Models”) explains how to design and implement the abstract syntax of a DSL in a variable manner. Chapter 4 (“Variable Context Conditions”) then provides the means to refine an abstract syntax (language model) by using composable context conditions (invariants). Next, Chapter 5 (“Variable Textual Syntaxes”) details solutions to implementing variable textual syntaxes for different types of DSL. In closing, Chapter 6 (“A Story of a DSL Family”) shows how to develop a mixed DSL in a step-by-step manner, demonstrating how the previously introduced techniques can be employed in an advanced example of developing a DSL family. The

book is intended for readers interested in language-oriented as well as model-driven software development, including software-engineering researchers and advanced software developers alike. An understanding of software-engineering basics (architecture, design, implementation, testing) and software patterns is essential. Readers should especially be familiar with the basics of object-oriented modelling (UML, MOF, Ecore) and programming (e.g., Java).

This book constitutes the refereed proceedings of the 7th International Conference on Model and Data Engineering, MEDI 2017, held in Barcelona, Spain, in October 2017. The 20 full papers and 7 short papers presented together with 2 invited talks were carefully reviewed and selected from 69 submissions. The papers are organized in topical sections on domain specific languages; systems and software assessments; modeling and formal methods; data engineering; data exploration and exploitation; modeling heterogeneity and behavior; model-based applications; and ontology-based applications.

This tutorial volume includes the revised and extended tutorials (briefings) held at the 5th International Summer School on Grand Timely Topics in Software Engineering, GTTSE 2015, in Braga, Portugal, in August 2015. GTTSE 2015 applied a broader scope to include additional areas of software analysis, empirical research, modularity, and product lines. The tutorials/briefings cover probabilistic program analysis, ontologies in software engineering, empirical evaluation of programming and

programming languages, model synchronization management of software product families, "people analytics" in software development, DSLs in robotics, structured program generation techniques, advanced aspects of software refactoring, and name binding in language implementation.

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Model-driven software development drastically alters the software development process, which is characterized by a high degree of innovation and productivity. *Emerging Technologies for the Evolution and Maintenance of Software Models* contains original academic work about current research and research projects related to all aspects affecting the maintenance, evolution, and reengineering (MER), as well as long-term management, of software models. The mission of this book is to present a comprehensive and central overview of new and emerging trends in software model research and to provide concrete results from ongoing developments in the field. This book constitutes the proceedings of the 16th International Conference on Perspectives in Business Informatics Research, BIR 2017, held in Copenhagen, Denmark, in August 2017. This year the BIR conference attracted 59 submissions from 23 countries. They were reviewed by 45 members of the Program Committee, and as a result, 17 full papers and 3 short papers were selected for presentation at the conference and publication in this volume. They are organized in sections on enterprise architecture, business process management, business analytics, information systems

applications, and information systems development. In addition, the summaries of the two conference keynotes are also included. This year, the conference theme was the digital transformation, which will impact most businesses, organizations and societies and call for new and radical approaches to how we adopt, use and manage IT.

This book presents a comprehensive documentation of the scientific outcome of satellite events held at the 14th International Conference on Model-Driven Engineering, Languages and Systems, MODELS 2011, held in Wellington, New Zealand, in October 2011. In addition to 3 contributions each of the doctoral symposium and the educators' symposium, papers from the following workshops are included: variability for you; multi-paradigm modeling; experiences and empirical studies in software modelling; models@run.time; model-driven engineering, verification and validation; comparing modeling approaches; models and evolution; and model-based architecting and construction of embedded systems.

This book constitutes the thoroughly refereed proceedings of the 7th International Conference on Software and Data Technologies, ICSOFT 2012, held in Rome, Italy, in July 2012. The 14 revised full papers presented were carefully reviewed and selected from 127 submissions. The papers focus on the following research topics and applications: programming issues, theoretical aspects of software engineering, management information systems, distributed systems, ubiquity, data interoperability, context understanding.

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Domain engineering is a set of activities intended to develop, maintain, and manage the creation and evolution of an area of knowledge suitable for processing by a range of software systems. It is of considerable practical significance, as it provides methods and techniques that help reduce time-to-market, development costs, and project risks on one hand, and helps improve system quality and performance on a consistent basis on the other. In this book, the editors present a collection of invited chapters from various fields related to domain engineering. The individual chapters present state-of-the-art research and are organized in three parts. The first part focuses on results that deal with domain engineering in software product lines. The second part describes how domain-specific languages are used to support the construction and deployment of domains. Finally, the third part presents contributions dealing with domain engineering within the field of conceptual modeling. All chapters utilize a similar terminology, which will help readers to understand and relate to the chapters content. The book will be especially rewarding for researchers and students of software engineering methodologies in general and of domain engineering and its related fields in particular, as it contains the most comprehensive and up-to-date information on this topic. This book constitutes the thoroughly refereed proceedings of the 8th International Haifa Verification Conference, HVC 2012, held in Haifa, Israel in November 2012. The 18 revised full papers presented together with 3 poster presentations were carefully reviewed and selected from 36 submissions. They focus on the future directions of

testing and verification for hardware, software, and complex hybrid systems. This book constitutes the refereed proceedings of the 25th International Conference on Advanced Information Systems Engineering, CAiSE 2013, held in Valencia, Spain, in June 2013. The 44 revised full papers were carefully reviewed and selected from 162 submissions. The contributions have been grouped into the following topical sections: services; awareness; business process execution; products; business process modelling; modelling languages and meta models; requirements engineering 1; enterprise architecture; information systems evolution; mining and predicting; data warehouses and business intelligence; requirements engineering 2; knowledge and know-how; information systems quality; and human factors.

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