# Table of Contents

## Preface

Preface .............................................................................................................................................. xxviii

## Volume I

### Section 1

#### Fundamental Concepts and Theories

This section provides an overview of both traditional and recently developed paradigms in Software Design and Development. Despite being one of the youngest scientific fields, software engineering has developed quickly, and has a rich history of practices and procedures to draw from. In particular, this section addresses agile, lean, and service-oriented development; cloud computing and web-based services; and model-driven engineering. In the opening 11 chapters of this extensive reference source, readers will obtain a clear understanding of the fundamental concepts and theories integral to the field of Software Design and Development.

### Chapter 1

A Roadmap for Software Engineering for the Cloud: Results of a Systematic Review ....................... 1  
Abhishek Sharma, University of Calgary, Canada  
Frank Maurer, University of Calgary, Canada

### Chapter 2

A Survey on Secure Software Development Lifecycles ........................................................................... 17  
José Fonseca, DEI/CISUC, University of Coimbra/UDI, Polytechnic Institute of Guarda, Portugal  
Marco Vieira, DEI/CISUC, University of Coimbra, Portugal

### Chapter 3

A Review of Software Quality Methodologies ...................................................................................... 34  
Saqib Saeed, University of Siegen, Germany  
Farrukh Masood Khawaja, Ericsson Telekommunikation GmbH, Germany  
Zaigham Mahmood, University of Derby, UK

### Chapter 4

Adapting Test-Driven Development to Build Robust Web Services .................................................. 50  
Nuno Laranjeiro, Universidade de Coimbra, Portugal  
Marco Vieira, Universidade de Coimbra, Portugal
Chapter 5
A Software Engineering Framework for Context-Aware Service-Based Processes in Pervasive Environments .......................................................... 71
Zakwan Jaroucheh, Edinburgh Napier University, UK
Xiaodong Liu, Edinburgh Napier University, UK
Sally Smith, Edinburgh Napier University, UK

Chapter 6
Agile Software: Body of Knowledge.......................................................... 96
Zaidoun Alzoabi, Martin Luther University, Germany

Chapter 7
Toward Agile Interactive Software Development Process Models for Crowd Source Projects ............ 117
Izzat Alsmadi, Yarmouk University, Jordan
Saqib Saeed, Bahria University, Pakistan

Chapter 8
Agile, Lean, and Service-Oriented Development, Continuum, or Chasm ........................................... 132
Juha Rikkilä, Studios 4 Future Software, Free University of Bozen-Bolzano, Italy

Chapter 9
Addressing Highly Dynamic Changes in Service-Oriented Systems: Towards Agile Evolution and Adaptation................................................................. 164
Andreas Metzger, Paluno (The Ruhr Institute for Software Technology), University of Duisburg-Essen, Germany
Elisabetta Di Nitto, Politecnico di Milano, Italy

Chapter 10
Model-Driven Engineering, Services and Interactive Real-Time Applications .......................... 178
Luis Costa, SINTEF ICT, Norway
Neil Loughran, SINTEF ICT, Norway
Roy Grønmo, SINTEF ICT, Norway

Chapter 11
Requirements Engineering Process Improvement and Related Models ........................................... 203
Badariah Solemon, Universiti Tenaga Nasional, Malaysia
Shamsul Sahibuddin, Universiti Teknologi Malaysia, Malaysia
Abdul Azim Abd Ghani, Universiti Putra Malaysia, Malaysia
Section 2
Development and Design Methodologies

This section discusses techniques and best practices in Software Design and Development. Models and processes are crucial to ensure quality and consistency in software products, and developers must understand how to best apply and adapt existing methodologies to current projects. Primary topics covered in this section include model-driven software development, test-driven approaches, and embedded software systems. The 14 chapters that make up this section explore the development and design methodologies that bridge the gap between fundamental concepts and real-world applications in Software Design and Development.

Chapter 12
Component-Based Modeling for Information Systems Reengineering .............................................. 220
Malleswara Talla, Concordia University, Canada
Raul Valverde, Concordia University, Canada

Chapter 13
Model-Driven Development of Mobile Information Systems ............................................................... 235
Ralf Bruns, Hannover University of Applied Sciences and Arts, Germany
Jürgen Dünk, Hannover University of Applied Sciences and Arts, Germany

Chapter 14
Constructive Knowledge Management Model and Information Retrieval Methods for Software Engineering ........................................................................................................... 253
Zeyar Aung, Masdar Institute of Science and Technology, UAE
Khine Khine Nyunt, King Faisal University, Kingdom of Saudi Arabia

Chapter 15
A Middleware Architecture for Developing Mobile Applications ............................................................ 270
Hana Rubinsztejn, Federal University of Mato Grosso do Sul, Brazil
José Viterbo, Federal Fluminense University, Brazil
Vagner Sacramento, Institute of Informatics, Federal University of Goias, Brazil
Ricardo Rocha, Institute of Informatics, Federal University of Goias, Brazil
Gustavo Baptista, Pontifical Catholic University of Rio de Janeiro, Brazil
Markus Endler, Pontifical Catholic University of Rio de Janeiro, Brazil

Chapter 16
Tool Based Integration of Requirements Modeling and Validation into Business Process Modeling ......................................................................................................................... 285
Sven Feja, Christian-Albrechts-University of Kiel, Germany
Sören Witt, Christian-Albrechts-University of Kiel, Germany
Andreas Speck, Christian-Albrechts-University of Kiel, Germany
Chapter 17
What is the Benefit of a Model-Based Design of Embedded Software Systems in the Car Industry?

Manfred Broy, Technical University Munich, Germany
Sascha Kirstan, Altran Technologies, Germany
Helmut Krcmar, Technical University Munich, Germany
Bernhard Schätz, Technical University Munich, Germany

310

Chapter 18
Project Contexts and the Possibilities for Mixing Software Development and Systems Approaches

D. Petkov, Eastern Connecticut State University, USA
S. Alter, University of San Francisco, USA
J. Wing, Durban University of Technology, South Africa
A. Singh, Durban University of Technology, South Africa
O. Petkova, Central Connecticut State University, USA
T. Andrew, Durban University of Technology, South Africa
K. Sewchurran, University of Cape Town, South Africa

335

Chapter 19
SaaS Requirements Engineering for Agile Development

Asif Qumer Gill, University of Sydney, Australia
Deborah Bunker, University of Sydney, Australia

351

Chapter 20
A Test-Driven Approach to Behavioral Queries for Service Selection

Laura Zavala, University of Maryland Baltimore County, USA
Benito Mendoza, New York City College of Technology, USA
Michael N. Huhns, University of South Carolina, USA

381

Chapter 21
Data Mining Techniques for Software Quality Prediction

Bharavi Mishra, Indian Institute of Technology (BHU), India
K. K. Shukla, Indian Institute of Technology (BHU), India

401

Chapter 22
A Method for Model-Driven Information Flow Security

Fredrik Seehusen, SINTEF, Norway
Ketil Stølen, SINTEF, University of Oslo, Norway

429

Chapter 23
Modelling Situation Awareness Information and System Requirements for the Mission using Goal-Oriented Task Analysis Approach

Cyril Onwubiko, Research Series Limited, UK

460
Section 3
Tools and Technologies

This section elaborates on the previous foundational chapters to explore the basic building blocks of Software Design and Development. Software developers utilize a diverse bag of tricks to effectively create and maintain software systems, coding and programming languages among the most significant. Domain-Specific Languages (DSLs), mobile applications, and user-centered design practices are a few of the instruments discussed in this section. With 13 chapters, this section offers a broad treatment of some of the many tools and technologies within Software Design and Development.
Chapter 29
DSLs in Action with Model Based Approaches to Information System Development ........................................596
  Ivan Luković, University of Novi Sad, Serbia
  Vladimir Ivančević, University of Novi Sad, Serbia
  Milan Čeliković, University of Novi Sad, Serbia
  Slavica Aleksić, University of Novi Sad, Serbia

Chapter 30
Information Systems and Software Development ................................................................................................627
  Arshad Siddiqi, Institute of Business Administration, Pakistan

Chapter 31
Nature-Inspired Toolbox to Design and Optimize Systems ..............................................................................644
  Satvir Singh, Shaheed Bhagat Singh College of Engineering & Technology, India
  Arun Khosla, Dr. B. R. Ambedkar National Institute of Technology, India
  J. S. Saini, Deenbandhu Chhotu Ram University of Science & Technology, India

Chapter 32
Pragmatic Software Engineering for Computational Science ...............................................................................663
  David Worth, Science and Technology Facilities Council, UK
  Chris Greenough, Science and Technology Facilities Council, UK
  Shawn Chin, Science and Technology Facilities Council, UK

Chapter 33
Creating, Debugging, and Testing Mobile Applications with the IPAC Application Creation Environment ........................................................................................................................................695
  Kostas Kolomvatsos, National & Kapodistrian University of Athens, Greece
  George Valkanas, National & Kapodistrian University of Athens, Greece
  Petros Patelis, National & Kapodistrian University of Athens, Greece
  Stathes Hadjiefthymiades, National & Kapodistrian University of Athens, Greece

Chapter 34
Requirements Specification as Basis for Mobile Software Quality Assurance ..................................................719
  Raquel Lacuesta, Universidad de Zaragoza, Spain
  Luis Fernández-Sanz, Universidad de Alcalá, Spain
  María del Pilar Romay, Universidad San Pablo-CEU, Spain

Chapter 35
Quality, Improvement and Measurements in High Risk Software ......................................................................733
  Edgardo Palza Vargas, University of Ottawa, Canada

Chapter 36
Reengineering Structured Legacy System Documentation to UML Object-Oriented Artifacts ...........................749
  Terrence P. Fries, Indiana University of Pennsylvania, USA
Chapter 37
User-Centered Design of Mobile Geo-Applications ............................................................... 772
Corné P. J. M. Van Elzakker, University of Twente, The Netherlands
Ioannis Delikostidis, University of Münster, Germany

Chapter 38
Towards an Integrated Personal Software Process and Team Software Process Supporting Tool ................................................................. 788
Ho-Jin Choi, Korea Advanced Institute of Science and Technology, South Korea
Sang-Hun Lee, Korea Advanced Institute of Science and Technology, South Korea
Syed Ahsan Fahmi, Korea Advanced Institute of Science and Technology, South Korea
Ahmad Ibrahim, Korea Advanced Institute of Science and Technology, South Korea
Hyun-Il Shin, Korea Advanced Institute of Science and Technology, South Korea
Young-Kyu Park, Korea Advanced Institute of Science and Technology, South Korea

Section 4
Organizational and Social Implications
This section follows the theoretical first half of this reference with chapters on practical applications of Software Design and Development. In the Information Age, software and web applications are necessary elements to the success of a nearly ubiquitous array of businesses and organizations. In particular, businesses can more effectively manage their resources, engineers can develop new tools and technologies, and educators can use software to bring learning to students across the globe. The 15 chapters in this section provide an in-depth examination of the utilization and application of the fundamental principles of Software Design and Development.

Chapter 39
Implementation of the Personal Software Process in Academic Settings and Current Support Tools ................................................................. 807
Mohd Hairul Nizam Md Nasir, University of Malaya, Malaysia
Nur Aalyaa Alias, Two Sigma Technologies, Malaysia
Shukor Sanim Mohd Fauzi, Universiti Teknologi Mara, Malaysia
Mohd Hashim Massatu, Two Sigma Technologies, Malaysia

Chapter 40
Developing a Web-Based Cooperative Environment to Software Project Development ............... 839
Seyed Morteza Babamir, University of Kashan, Iran

Chapter 41
Trust Building Process for Global Software Development Teams: A Review from the Literature ................................................................. 864
Adrián Hernández-López, Universidad Carlos III de Madrid, Spain
Ricardo Colomo-Palacios, Universidad Carlos III de Madrid, Spain
Ángel García-Crespo, Universidad Carlos III de Madrid, Spain
Pedro Soto-Acosta, University of Murcia, Spain
Chapter 42
Connection, Fragmentation, and Intentionality: Social Software and the Changing Nature of Expertise ................................................................. 883
Christopher Watts, St. Lawrence University, USA

Chapter 43
Extracting Social Relationships from Social Software ........................................ 902
Jürgen Dorn, Vienna University of Technology, Austria
Stefan Labitzke, Vienna University of Technology, Austria

Chapter 44
Establishing Ethos on Proprietary and Open Source Software Websites .................. 915
Kevin Brock, North Carolina State University, USA

Chapter 45
Security Risks in Cloud Computing: An Analysis of the Main Vulnerabilities .................. 936
Belén Cruz Zapata, University of Murcia, Spain
José Luis Fernández Alemán, University of Murcia, Spain

Chapter 46
Assessing the Security of Software Configurations ........................................ 953
Afonso Araújo Neto, University of Coimbra, Portugal
Marco Vieira, University of Coimbra, Portugal

Chapter 47
Embedded Systems Security ................................................................. 980
Muhammad Farooq-i-Azam, COMSATS Institute of Information Technology, Pakistan
Muhammad Naeem Ayyaz, University of Engineering and Technology, Pakistan

Chapter 48
Creating and Applying Security Goal Indicator Trees in an Industrial Environment .................. 999
Alessandra Bagnato, TXT e-solutions, Italy
Fabio Raiteri, TXT e-solutions, Italy
Christian Jung, Fraunhofer Institute for Experimental Software Engineering, Germany
Frank Elberzhager, Fraunhofer Institute for Experimental Software Engineering, Germany

Chapter 49
User-Centered Business Process Modeling and Pattern-Based Development for Large Systems ................................................................. 1014
O. Takaki, Japan Advanced Institute of Science and Technology, Japan
T. Seino, Maebashi Kyoai Gakuen College, Japan
N. Izumi, National Institute of Advanced Industrial Science and Technology, Japan
K. Hasida, National Institute of Advanced Industrial Science and Technology, Japan
Chapter 50
SEMantic PATHways: Modeling, Executing, and Monitoring Intra-Organizational Healthcare Business Processes towards Personalized Treatment ................................................................. 1036
Dimitrios Al. Alexandrou, UBITECH Research, Greece & National Technical University of Athens, Greece
Konstantinos V. Pardalis, UBITECH Research, Greece

Section 5
Utilization and Application

This section explores the impact of Software Design and Development on users and developers. Security issues are a particularly pressing concern, with developers constantly striving to create increasingly advanced encryption tools to match the parallel efforts of hackers and intruders. In addition to security risks in cloud computing and software systems, these chapters cover topics ranging from social relationships and social software to web-based collaboration tools and user-centered modeling approaches. In these 12 chapters, readers will find an in-depth discussion on some of the most pressing organizational and social implications of Software Design and Development.

Chapter 51
The Design and Implementation of Paperless Medical System (PMS) for Offshore Operating Company: A Structured Approach .......................................................................................................................... 1064
Nabil Ghalib, Business International Group, UAE

Chapter 52
New Tools in Hardware and Software Design Applied for Remote Photovoltaic Laboratory ........ 1073
Petru A. Cotfas, Transylvania University of Brasov, Romania
Daniel T. Cotfas, Transylvania University of Brasov, Romania
Doru Ursutiu, Transylvania University of Brasov, Romania
Cornel Samoila, Transylvania University of Brasov, Romania
Dragos Iordache, Transylvania University of Brasov, Romania

Volume III

Chapter 53
A Comparative Analysis of Software Engineering Approaches for Sequence Analysis ............ 1093
Muneer Ahmad, King Faisal University, Saudi Arabia
Low Tang Jung, University Technology PETRONAS, Malaysia
Noor Zaman, King Faisal University, Saudi Arabia

Chapter 54
The Role of Formal Methods in Software Development for Railway Applications .................. 1103
Alessandro Fantechi, Università degli Studi di Firenze, Italy
Chapter 55
Mivθa: A Framework for Auto-Programming and Testing of Railway Controllers for Varying Clients

Jörn Guy Süß, University of Queensland, Australia
Neil Robinson, RGB Assurance, Australia
David Carrington, University of Queensland, Australia
Paul Strooper, University of Queensland, Australia

Chapter 56
A Hierarchically Structured Collective of Coordinating Mobile Robots Supervised by a Single Human

Choon Yue Wong, Nanyang Technological University, Singapore
Gerald Seet, Nanyang Technological University, Singapore
Siang Kok Sim, Nanyang Technological University, Singapore
Wee Ching Pang, Nanyang Technological University, Singapore

Chapter 57
Improving Lean, Service-Oriented Software Development at Codeweavers Ltd

Paul Shannon, 7digital Ltd, UK
Neil Kidd, Codeweavers Ltd, UK
Paul Barrett, Codeweavers Ltd, UK
Chris Knight, Codeweavers Ltd, UK
Sam Wessel, Esendex Ltd, UK

Chapter 58
Modular Game Engine Design

Aaron Boudreaux, University of Louisiana at Lafayette, USA
Brandon Primeaux, University of Louisiana at Lafayette, USA

Chapter 59
Design of Language Learning Software

Vehbi Turel, The University of Bingol, Turkey
Peter McKenna, Manchester Metropolitan University, UK

Chapter 60
Design and Development Considerations for a Multilingual Digital Library

Anne R. Diekema, Utah State University, USA

Chapter 61
Reengineering the Portal to Texas HistorySM: A Case Study

Kathleen Murray, University of North Texas, USA
Mark Phillips, University of North Texas, USA
William Hicks, University of North Texas, USA
Neena Weng, University of North Texas, USA
Dreanna Belden, University of North Texas, USA
Chapter 62
A Systematic Approach for Designing Educational Recommender Systems ........................................... 1264
Patrick H. S. Brito, Federal University of Alagoas, Brazil
Ig Ibert Bittencourt, Federal University of Alagoas, Brazil
Aydano Pamponet Machado, Federal University of Alagoas, Brazil
Evandro Costa, Federal University of Alagoas, Brazil
Olavo Holanda, Federal University of Alagoas, Brazil
Rafael Ferreira, Federal University of Pernambuco, Brazil
Thiago Ribeiro, Federal University of Alagoas, Brazil

Chapter 63
Engineering and Reengineering of Technology Enhanced Learning Scenarios Using Context Awareness Processes ........................................................................................................................................ 1289
Clara Inés Peña de Carrillo, Universidad Industrial de Santander, Colombia
Christophe Choquet, University of Maine, France
Christophe Després, University of Maine, France
Sébastien Iksal, University of Maine, France
Pierre Jacoboni, University of Maine, France
Aïna Lekira, University of Maine, France
El Amine Ouraiba, University of Maine, France
Diem Pham Thi-Ngoc, University of Maine, France

Chapter 64
Implementing Internal Software Process Assessment: An Experience at a Mid-Size IT Company ............................................................................................................................................. 1314
Shukor Sanim Mohd Fauzi, Universiti Teknologi Mara, Malaysia
Nuraminah Ramli, Universiti Pendidikan Sultan Idris, Malaysia
Mustafa Kamal Mohd Nor, University of Malaya, Malaysia

Chapter 65
The Development of International Standards to Facilitate Process Improvements for Very Small Entities ........................................................................................................................................ 1335
Claude Y. Laporte, École de Technologie Supérieure, Canada
Edgardo Palza Vargas, École de Technologie Supérieure, Canada

Section 6
Managerial Impact
This section addresses common concerns of managers and leaders of Software Design and Development teams. In the IT industry, creation of viable, useful software systems can be an elaborate process, and managers who are able to effectively organize and oversee their programmers are crucial in the development of high-quality final products. The topics explored in this section include improving software processes, decision-making in complex systems, and management of software projects, among others. This section's 12 chapters examine the managerial impact of key topics in the field of Software Design and Development.
Chapter 66
Software Process Improvement for Small and Very Small Enterprises ................................. 1363
Mohammad Zarour, King Abdulaziz City for Science and Technology, Saudi Arabia
Alain Abran, École de Technologie Supérieure, Canada
Jean-Marc Desharnais, Boğaziçi University, Turkey

Chapter 67
Benefits of CMM and CMMI-Based Software Process Improvement ................................. 1385
Maged Abdullah, University of Malaya, Malaysia
Rodina Ahmad, University of Malaya, Malaysia
Lee Sai Peck, University of Malaya, Malaysia
Zarinah Mohd Kasirun, University of Malaya, Malaysia
Fahad Alshammari, University of Malaya, Malaysia

Chapter 68
Software Engineering, Process Improvement, and Experience Management: Is the Nexus
Productive? Clues from the Indian Giants ................................................................. 1401
Neeraj Sharma, Punjabi University, India
Kawaljeet Singh, Punjabi University, India
D.P. Goyal, Management Development Institute, India

Chapter 69
Measuring the Progress of a System Development ..................................................... 1415
Marta (Pląska) Olszewska, Åbo Akademi University, Finland & Turku Centre for Computer
Science, Finland
Marina Waldén, Åbo Akademi University, Finland & Turku Centre for Computer Science, Finland

Chapter 70
High-Level Modeling to Support Software Design Choices ......................................... 1440
Gerrit Muller, Buskerud University College, Norway

Chapter 71
A Model to Assist the Maintenance vs. Replacement Decision in Information Systems ............. 1461
O. Tolga Pusatli, Cankaya University, Turkey
Brian Regan, University of Newcastle, Australia

Chapter 72
A Game Theoretic Solution for the Optimal Selection of Services ................................... 1481
Salah Merad, Office for National Statistics, UK
Rogério de Lemos, University of Kent, UK
Tom Anderson, Newcastle University, UK
Section 7
Critical Issues

This section objectively evaluates many of the methods and strategies commonly employed in Software Design and Development environments. Researchers on the cutting edge of software engineering technologies are constantly evaluating and analyzing new approaches for the improvement of pervasive software systems. Cloud computing, agile development, risk management, legacy systems, and code testing are only some of the topics given careful consideration in current research. In this section, 10 chapters explore some of the critical issues driving advances in Software Design and Development.
Chapter 78
Quality-Driven Software Development for Maintenance ...................................................... 1608
Iwona Dubielewicz, Wroclaw University of Technology, Poland
Bogumila Hnatkowska, Wroclaw University of Technology, Poland
Zbigniew Huzar, Wroclaw University of Technology, Poland
Lech Tuzinkiewicz, Wroclaw University of Technology, Poland

Volume IV

Chapter 79
Software Engineering Research: The Need to Strengthen and Broaden the Classical Scientific
Method ............................................................................................................................................ 1639
Gonzalo Génova, Universidad Carlos III de Madrid, Spain
Juan Llorens, Universidad Carlos III de Madrid, Spain
Jorge Morato, Universidad Carlos III de Madrid, Spain

Chapter 80
Software Design for Passing Sarbanes-Oxley in Cloud Computing ...................................... 1659
Solomon Lasluisa, Rutgers University, USA
Ivan Rodero, Rutgers University, USA
Manish Parashar, Rutgers University, USA

Chapter 81
Knowledge Management in Agile Methods Context: What Type of Knowledge Is Used by
Agilest? ............................................................................................................................................. 1675
Zaidoun Alzoabi, Martin Luther University, Germany

Chapter 82
Business Intelligence and Agile Methodology for Risk Management in Knowledge-Based
Organizations ................................................................................................................................. 1709
Muhammad Mazen Almustafa, The Arab Academy for Banking and Financial Sciences, Syria
Dania Alkhaldi, The Arab Academy for Banking and Financial Sciences, Syria

Chapter 83
Business Risk Analysis: Obsolescence Management in Requirements Engineering .................. 1735
Jasbir Virdi, University of Toronto, UK

Chapter 84
Analyses of Evolving Legacy Software into Secure Service-Oriented Software using
Scrum and a Visual Model .............................................................................................................. 1763
Sam Chung, Institute of Technology, University of Washington, USA
Conrado Crompton, Institute of Technology, University of Washington, USA
Yan Bai, Institute of Technology, University of Washington, USA
Barbara Endicott-Popovsky, University of Washington, USA
Seung-Ho Baeg, Korea Institute of Industrial Technology, Korea
Sangdeok Park, Korea Institute of Industrial Technology, Korea
Chapter 85
Resolving Conflict in Code Refactoring ................................................................. 1786
Lakhwinder Kaur, Apeejay Institute of Management Technical Campus, India
Kuljit Kaur, Guru Nanak Dev University, India
Ashu Gupta, Apeejay Institute of Management Technical Campus, India

Chapter 86
Website Performance Measurement: Process and Product Metrics.......................... 1800
Izzat Alsmadi, Yarmouk University, Jordan

Chapter 87
How Much Automation can be done in Testing? .................................................... 1827
Izzat Alsmadi, Yarmouk University, Jordan

Section 8
Emerging Trends

This section peers into the future of Software Design and Development, using current advances to extrapolate new innovations, applications, and possibilities. Computer science is a rapidly expanding field with applications in a plethora of disciplines, so researchers must constantly stay abreast of the latest advances in software engineering technologies. Chapters in this section focus primarily on reusable software services and software security in the cloud, but additional topics include mobile computing, pervasive computational systems, and evaluation and testing practices. The final 13 chapters of this extensive 4-volume reference conclude with a detailed look at emerging trends in the field of Software Design and Development.

Chapter 88
Cloud-Based Testing for Context-Aware Cyber-Physical Systems ................................ 1850
Christian Berger, University of Gothenburg, Sweden

Chapter 89
Software Development Using Service Syndication based on API Handshake Approach between Cloud-Based and SOA-Based Reusable Services ......................................................... 1877
Vishav Vir Singh, Intersil Corporation, USA

Chapter 90
Software Reuse in Open Source: A Case Study ....................................................... 1899
Andrea Capiluppi, Brunel University, UK
Klaas-Jan Stol, The Irish Software Engineering Research Centre, University of Limerick, Ireland
Cornelia Boldyreff, University of East London, UK

Chapter 91
Reuse across Multiple Architectures ........................................................................ 1926
Indika Kumara, WSO2 Inc, Sri Lanka
Chandana Gamage, University of Moratuwa, Sri Lanka
Chapter 92
Reusing Services through Context-Aware Discovery and Adaptation in Pervasive Systems .......... 1955
  Javier Cubo, University of Málaga, Spain
  Ernesto Pimentel, University of Málaga, Spain

Chapter 93
Multiple Multimodal Mobile Devices: Lessons Learned from Engineering Lifelog Solutions ....... 2013
  Daragh Byrne, CLARITY: Centre for Sensor Web Technologies, Ireland & Centre for Digital Video Processing, Dublin City University, Ireland
  Liadh Kelly, Centre for Digital Video Processing, Dublin City University, Ireland
  Gareth J.F. Jones, Centre for Digital Video Processing, Dublin City University, Ireland

Chapter 94
The Use of HCI Approaches into Distributed CSCL Activities Applied to Software Engineering Courses .............................................................................................................................................. 2032
  Fáber D. Giraldo, University of Quindio, Colombia
  María Lilí Villegas, University of Quindio, Colombia
  César A. Collazos, University of Cauca, Colombia

Chapter 95
A Model-Driven Approach to Service Composition with Security Properties ......................... 2050
  Stéphanie Chollet, Laboratoire d’Informatique de Grenoble, France
  Philippe Lalanda, Laboratoire d’Informatique de Grenoble, France

Chapter 96
Towards Test-Driven and Architecture Model-Based Security and Resilience Engineering ........ 2071
  Ayda Saidane, University of Luxembourg, Luxembourg
  Nicolas Guelfi, University of Luxembourg, Luxembourg

Chapter 97
Innovative Strategies for Secure Software Development .............................................................. 2098
  Punam Bedi, University of Delhi, India
  Vandana Gandotra, University of Delhi, India
  Archana Singhal, University of Delhi, India

Chapter 98
Evaluating the Usability of Domain-Specific Languages ............................................................. 2119
  Ankica Barisić, Universidade Nova de Lisboa, Portugal
  Vasco Amaral, Universidade Nova de Lisboa, Portugal
  Miguel Goulão, Universidade Nova de Lisboa, Portugal
  Bruno Barroca, Universidade Nova de Lisboa, Portugal
Chapter 99
The Incremental Commitment Spiral Model for Service-Intensive Projects ........................................... 2141
   Supannika Koolmanojwong, University of Southern California, USA
   Barry Boehm, University of Southern California, USA
   Jo Ann Lane, University of Southern California, USA

Chapter 100
Service Composition Verification and Validation ................................................................. 2162
   Manuel Palomo-Duarte, University of Cadiz, Spain

Index................................................................................................................................................... xxxi