Tutorials
Building Safety-Critical Systems Through Architecture-Based Systematic Reuse

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Abstract. Studies have shown that 70% of all defects are inserted during the very early phases of development, but most of those defects are not found until very late in development. The Architecture Analysis and Design Language (AADL) provides the basis for creating highly detailed models that support a “virtual integration” approach to architecture development. Through a set of domain specific languages, which support requirements definition, verification activities, and architectural modeling, the development team is able to incrementally design and analyze a system model. Those analyses are used to identify functional and non-functional requirements that are not satisfied at the time of the analysis by the architecture described in the model. This early “virtual integration” of the system using architectural-level components has been shown to facilitate early defect detection and a reduction of overall development effort by as much as 30%. This tutorial will survey this environment, present a specific example, and set the attendee up to explore the role of the tools in defining systems. This is a new tutorial although a similar tutorial at Saturn 2016 received very good reviews.

Bio

John D. McGregor is an associate professor of computer science at Clemson University, and a Software Architecture Researcher at the Software Engineering Institute. He regularly engages large software development organizations at all levels from strategic to tactical to the concrete. His research interests include highly-reliable software-intensive systems, software product lines, socio-technical ecosystems, model-driven development, and software/system architecture. He serves on the program committee of six to ten conferences per year. He researches, writes, and practices strategic software engineering. His consulting has included satellite operating systems, telephony infrastructure, cell phones, software certification, and software-defined radios.

Roselane S. Silva is a masters degree student of Computer Science at Federal University of Bahia (UFBA) and a member of RiSE Labs (Reuse in Software Engineering) at UFBA. She was selected for a study abroad program and studied...
in the United States during the 2014–2015 academic year. For SPL research, Roselane is working with the Strategic Software Engineering Research Group at Clemson University on architectures for families of safety critical systems. Her architecture artifacts are being used by the Software Engineering Institute of Carnegie Mellon University as pedagogical examples.
Reusing Use Case and Test Case Specification Modeling

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Abstract. Typically, use case specifications are structured, unrestricted textual documents conforming to a use case template. Since use case models are mostly text-based, ambiguity is unavoidable. This tutorial will present a use case modeling approach, called Restricted Use Case Modeling (RUCM), consisting of distinct restriction rules and an adapted use case template. Our objectives are: (1) limit the way users specify use case specifications with the goal of decreasing ambiguity, (2) provide built-in mechanisms to support reuse of use case specifications, and (3) enable automated analyses, e.g., generation of UML models and test cases.

Previously, we developed Zen-RUCM (a framework) composed of natural language-driven specification and modeling of requirements followed by generation of UML models and test cases. A chain of methodologies implemented in tools were developed and evaluated with real world case studies. These included: requirements modeling for real-time systems (RUCM4RT), test case specifications (RTCM) and automatic test case generation. This tutorial focuses on Zen-RUCM, RUCM, RUCM4RT, and RTCM methodologies, along with tool demonstration on real-world case studies. Particularly, we will focus on reuse of use case specifications, and test case specification.

Bio

Tao Yue is a chief research scientist of Simula Research Laboratory, Oslo, Norway and adjunct associate professor at University of Oslo, where she is leading the expertise area of Model Based Engineering (MBE). She is also affiliated to University of Oslo as an associate professor. She has received the PhD degree in the Department of Systems and Computer Engineering at Carleton University, Ottawa, Canada in 2010. Before that, she was an aviation engineer and system engineer for seven years. She has around 16 years of experience of conducting industry-oriented research with a focus on MBE in various application domains such as Avionics, Maritime and Energy, and Communications in several countries including Canada, Norway, and China. Her present research area is software engineering, with specific interested in requirements engineering, requirements-based testing, model-based product line engineering, model-based system engineering, model-based testing and empirical software engineering. Dr. Yue has been on the
program and organization committees of many international, IEEE and ACM conferences such as MODELS, RE, and SPLC. She is PI and CO-PI of several national and international research projects. She is also actively participating in defining international standards such as Uncertainty Modeling.

Shaukat Ali is currently a senior research scientist in the Software Engineering department, Simula Research Laboratory, Norway. His research focuses on devising novel methods for Verification and Validation (V&V) of large scale highly connected software-based systems that are commonly referred to as Cyber-Physical Systems (CPSs). He has been involved in several basic research, research-based innovation, and innovation projects in the capacity of PI/Co-PI related to Model-based Testing (MBT), Search-Based Software Engineering, and Model-Based System Engineering. He has rich experience of working in several countries including UK, Canada, Norway, and Pakistan. Shaukat has been on the program committees of several international conferences (e.g., MODELS, ICST, GEECO, SSBSE) and also served as a reviewer for several software engineering journals (e.g., TSE, IST, SOSYM, JSS, TEVC). He is also actively participating in defining international standards on software modeling in Object Management Group (OMG), notably a new standard on Uncertainty Modeling.
Workshop
2nd Workshop on Social, Human, and Economic Aspects of Software (WASHES)

Special Edition for Software Reuse

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Abstract. The Special Edition for Software Reuse of the Workshop on Social, Human, and Economic Aspects of Software (WASHES) aims at bringing together researchers and practitioners who are interested in social, human, and economic aspects of software. WASHES is a forum to discuss models, methods, techniques, and tools to achieve software quality, improve reuse and deal with the existing issues in this context. This special edition’s main topic is “Challenges of Reuse and the Social, Human, and Economic Aspects of Software”. We believe it is important to investigate software reuse beyond the technical perspective and understand how the non-technical barriers of reuse affect practices, processes and tools in practice.

1 Motivation

Human and social aspects in software development have been discussed by researchers and practitioners since methods, techniques, and tools affect (and are affected by) stakeholders and their interactions. Similarly, software is a source of value for business in several organizations, either being software suppliers or acquirers, representing the key factor for their economic success. Decisions made in the software development processes and activities have economic implications on the profit and/or cost perspectives. Then, stakeholders, their interactions, and the software value notion are crucial to quality and directly affect the benefits promoted by software reuse. As such, it is important to discuss models, methods, techniques, and tools to achieve software quality, improve reuse and deal with the existing issues in this context.

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2 Goals and Conclusion

The 2nd Workshop on Social, Human, and Economic Aspects of Software (“WASHES in Reuse”) aims at putting together competencies and technologies focusing on the interaction between critical aspects that influence software engineering and software quality. This year’s main topic seeks to bring together different perspectives in a specific forum in order to analyze software reuse in the light of social, human, and economic aspects.

In its first edition (2016) [1], the workshop was successfully co-located with the 15th Brazilian Symposium on Software Quality (SBQS 2016). WASHES 2016 had 50 attendees and received 30 submissions. After the final analysis, 6 full papers and 6 short papers were accepted. Additionally, 3 papers were presented as posters. A panel was promoted to discuss social, human and economic implications on software quality as well as to define the WASHES Research and Collaboration Roadmap.

WASHES Steering Committee is composed of 4 researchers from Federal University of Maranhão (UFMA, Brazil), Federal University of the State of Rio de Janeiro (UNIRIO, Brazil), Northern Arizona University (USA), and Pontifical Catholic University of Rio Grande do Sul (PUCRS, Brazil). This special edition is jointly organized by the 4 program chairs from Federal University of the State of Rio de Janeiro (UNIRIO, Brazil), Federal University of Rio de Janeiro (COPPE/UFRJ), Blekinge Institute of Technology (Sweden) & University of Oulu (Finland), and Clemson University (USA). WASHES Program Committee is composed of researchers with relevant expertise and production in the related research areas of the workshop. Program Committee Members conducted a rigorous double blind review process, in which each paper was evaluated and discussed in details by at least three members.

We welcome WASHES 2017 authors and other attendees, as well as ICSR 2017 participants. We would like to invite all participants to actively take part in discussions and integration moments provided by the workshop. Discussions on the investigation of reuse beyond the technical perspective will be performed in order to understand how the non-technical aspects influence (or are influenced by) software development management, processes and tools in practice.

Additionally, we would like to thank all researchers and practitioners who submitted their papers to WASHES 2017, the Steering and Program Committees’ members, and the organizers and sponsors of ICSR 2017, for their support for the accomplishment of this workshop.

Reference

Author Index

Ali, Shaukat 219
Alvim, Loreno Freitas Matos 31
Andrade, Rossana M.C. 65, 175
Assunção, Wesley K.G. 95

Bergel, Alexandre 155
Bezerra, Carla I.M. 65, 175
Blanc, Xavier 12

Charpentier, Alan 12
Chavez, Christina 201
Collet, Philippe 112

de Almeida, Eduardo Santana 31, 201
de Lima Fontão, Awdren 208
Dias-Neto, Arilo 208

Falleri, Jean-Rémy 12
Fernandes, Eduardo 48, 184
Figueiredo, Eduardo 48, 184
França, Marcelo 195

Garcia, Alessandro 48
Lee, Jaejoon 48
Lima, Crescencio 201
Lima, Luan P. 175
Lopez-Herrejon, Roberto E. 95

Machado, Ivan do Carmo 31, 65
McGee, Ethan T. 123
McGregor, John 223
McGregor, John D. 123, 217

Mendes, Emilia 223
Monteiro, José Maria 65, 175
Oliveira, Johnatan 184
Oumaziz, Mohamed A. 12

Santos, Rodrigo 208, 223
Schaefer, Ina 77
Schlie, Alexander 77
Silva, Leonardo Humberto 155
Silva, Roselane S. 123, 217
Sitaraman, Murali 139
Sousa, Leonardo 48

Térnava, Xhevahire 112
Teixeira, Eldanae 223

Uchôa, Anderson G. 65, 175
Vale, Gustavo 48, 184
Valente, Marco Tulio 155
Vergilio, Silvia R. 95

Wang, Huaimin 3
Wang, Tao 3
Welch, Daniel 139
Wille, David 77

Yang, Cheng 3
Yin, Gang 3
Yu, Yue 3
Yue, Tao 219

Zhang, Xunhui 3