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Requirements Engineering: Foundation for Software Quality

24th International Working Conference, REFSQ 2018
Utrecht, The Netherlands, March 19–22, 2018
Proceedings

Springer

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Preface

It is our great pleasure to welcome you to the proceedings of the 24th International Working Conference on Requirements Engineering Foundation for Software Quality. The REFSQ working conference series is a leading international forum for discussing requirements engineering (RE) and its many relations to quality. REFSQ aims at establishing an inclusive forum in which experienced researchers, PhD candidates, practitioners, and students can inform each other, learn about, discuss, and advance the state-of-the-art research and practice in the discipline of RE. The first REFSQ meeting took place in 1994. The conference has been organized as a stand-alone conference since 2010 and is now well established as a premier conference series on RE, located in Europe. REFSQ 2018 was held in Utrecht, The Netherlands, during March 19–22, 2018. We were excited to return to the location of the first REFSQ meeting in 1994.

RE is a critical factor in developing high-quality and successful software, systems, and services. Today, RE is expected to support engineering diverse types of systems of different scale and complexity such as information systems, embedded systems, mobile systems, or cyber-physical systems and is applied in diverse domains. Since the term "requirements engineering" was popularized 40 years ago by a special issue of the *IEEE Transactions on Software Engineering* in 1977, the community of practitioners and researchers have been working tirelessly on the identification, characterization, and evaluation of the multifaceted relationships between aspects of requirements processes, artifacts, and methods and aspects of software quality. We chose "RE and Digital Transformation" as the REFSQ 2018 special theme, to emphasize an important issue: the role RE can play in the dramatic changes that take place in our society today to innovate and design new heterogeneous systems and services to fit the needs of users and to take into account the values of society.

We are pleased to present this volume comprising the REFSQ 2018 proceedings. It features 23 papers included in the technical program of REFSQ 2018, presented during the conference. These papers were selected by an international Program Committee of leading experts in RE from both academia and industry. The committee evaluated the papers via a thorough peer-review process. This year, 73 abstracts were initially submitted. Eleven abstracts were not followed up by papers, one paper was withdrawn, and four papers were desk rejected. The review process included 57 papers. Each paper was reviewed by three members of the REFSQ 2018 Program Committee. An extensive online discussion among the Program Committee members enriched the reviews during the evaluation of the possible decision-making outcomes for each paper. During a face-to-face Program Committee meeting that took place on December 1, 2017, in Utrecht, The Netherlands, the papers were discussed and selected for inclusion in the conference proceedings. Authors of rejected papers were encouraged to submit their papers to the REFSQ 2018 satellite events.

The REFSQ 2018 conference was organized as a three-day symposium. Two conference days were devoted to presentation and discussion of scientific papers. The keynote speaker was Tanja Vos from the Open Universiteit and Universitat Politècnica de València. One conference day was devoted to presentation and discussion of industry experiences. This Industry Track offered an industrial keynote by Michiel van Genuchten from VitalHealth Software, followed by a full day program of talks. In a world cafe session at the end, industry practitioners discussed with the participating researchers various issues of industrial requirements engineering. In addition, the REFSQ conference program also included two live experiments as well as posters and tool presentations. Furthermore, satellite events, including several workshops and a doctoral symposium, were co-located with the conference. All papers from the main conference track can be found in the present proceedings. The papers included in the satellite events can be found in the REFSQ 2018 workshop proceedings published with CEUR.

REFSQ 2018 would not have been possible without the engagement and support of many individuals who contributed in many different ways. As editors of this volume, we would like to thank the REFSQ Steering Committee members, in particular Barbara Paech and Kurt Schneider, for their availability and for the excellent guidance they provided. Special thanks go to Klaus Pohl for his long-term engagement for REFSQ. We are indebted to Anna Perini and Paul Grünbacher, the REFSQ 2017 co-chairs, for their extremely helpful advice. We are grateful to all the members of the Program Committee for their timely and thorough reviews of the submissions and for their time dedicated to the online discussion and the face-to-face meeting. In particular, we thank those Program Committee members who volunteered to serve in the role of mentor, shepherd, or gatekeeper to authors of conditionally accepted papers. We would like to thank the members of the local organization at the Utrecht University for their ongoing support and determination to make sure all operational processes ran smoothly at all times. We are grateful to the chairs, who organized the various events included in REFSQ 2018.

Finally, we would like to thank Vanessa Stricker and Eric Schmieders for their excellent work in coordinating the background organization processes, and Anna Kramer for her support in preparing this volume.

We believe this volume provides an informative perspective on the conversations that shape the REFSQ 2018 conference. We hope you will find research results and truly new ideas to innovate and design new heterogeneous systems and services to fit the needs of users and to take into account the values of society.

January 2018

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Invited Talks

Testing Without Requirements?

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Abstract. Good requirements are the basis for high quality software. However, in industrial practice, the availability of decent requirements are still more an exception than common practice. One of the activities, the quality of which depends highly on requirements, is testing. Testing software systems without requirements can lead to unstructured testing that cannot give good insights into the quality of the System Under Test (SUT). We propose a completely different way of testing, that starts from having no requirements documented and will build up a test-suite and requirements while we test. For this we will present TESTAR, a tool for automated testing at the user interface level. TESTAR is different from existing approaches for testing at the user interface in that it does not need scripts nor does it generate scripts. TESTAR just tests on the fly looking for faults. TESTAR has predefined oracles that can automatically test general-purpose system requirements. To make TESTAR test specific requirements we need to refine these oracles and direct the tests. This can be done incrementally while we are already testing! In the keynote we will describe this approach and explain the future need of a test tool that learns itself what the best strategy is for testing.

No Free Lunch for Software After All

Michiel van Genuchten

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Abstract. The impact of software on products, industries and society is significant. Software put the computer industry upside down in the 1990's. Mobile phones followed in the first decade of this century. Medtech, the car industry and the financial industry are changing rapidly as we speak. The talk will be based on the personal experience of the presenter in various industries and the 40 columns that have been published in 'Impact' in IEEE Software. Insiders from companies such as Microsoft, Oracle, NASA, Hitachi, Tomtom and ASML have discussed the impact of software on their products and industries in the columns. Lessons learned include that software keeps growing at a surprisingly steady rate and volume (number of users of the software) is the key to success. A more sobering lesson is that software can easily be turned into a weapon of mass deceit, as has been proven by spammers, phishers, and an automobile company.

The lessons learned will be applied to better understand the requirements engineering and quality we need to create the software of the future. A couple of questions to be discussed: will we ever be able to engineer requirements and build proper roadmaps for future products? Is the quality we can achieve good enough for the applications we build? What foundations are needed for the next generation of software systems and where can science contribute?

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