

Foreword of the Thematic Track ICT Verification and Validation

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I. FOREWORD BY THE CHAIR

ICT systems are assuming a key role in real-life and are involving more and more human judgement, political legal and social aspects, technical facilities and limitations. As a result, guaranteeing that such systems satisfy their functional and non-functional requirements becomes at the same time imperative and increasingly difficult. Challenges descend, among others, from new infrastructures, heterogeneity, openness and continuous evolution, technical and semantic interoperability barriers, security and trust concerns. In this complex scenario, the Verification and Validation (V&V) activities, evolving in parallel with software development, represent an important and fundamental mean for guaranteeing the integrity, adequacy and requirements conformance of the ICT systems.

Following the tradition of the previous editions, the QUATIC 2014 ICT Verification and Validation track has collected innovative solutions, proposals and experiences for ICT quality assurance, seamlessly integrated within the ICT lifecycle, with a progressive shift from the traditional design-time model towards a run-time on-line one.

The papers selected in this track dedicate specific attention on approaches and methods for automatic model-based V&V, that can be easily integrated in the industrial context and can reduce the gap between research and practice. Thus proposals include innovative methodologies for test case generation and simulation in specific contexts, like nuclear control and railway interlocking systems; specific model-based testing approaches for mobile applications or components of telecommunication protocols; empirical investigation about the applicability of combinatorial testing tools in company, and testing strategies and framework useful in the access control environment.

Model-based V&V approaches are valid means for increase systematization, reusability and diminish the effort in modelling and testing of ICT systems. However one issue in the V&V process is how to use or adapt available V&V proposal to specific context and situations. To this purpose four papers of this track propose interesting solutions.

In “Automatic test set generation for function block based systems using model checking” Lahtinen faces this problem considering the nuclear instrumentation and control (I&C) systems, which are designed using a function block diagram description of the system itself. The author develops a technique, implemented into a proof-of-concept tool, for generating structure-based test sets for function block based.

In “Model-based testing for Mobile Applications” Costa, Nabuco and Paiva present a study aiming to assess the feasibility of using the pattern based GUI testing approach, PBGT, to test mobile applications. Although PBGT was developed having web applications in mind, authors identify the adaptations and updates necessary to the PBGT in order to test mobile applications.

In “On testing against partial non-observable specifications” Kushik, Yevtushenko and Cavalli focus on testing software components that implement telecommunication protocols. The authors discuss about how Finite State Machines (FSMs) might be used when deriving high quality tests and which properties can be held for corresponding FSMs when increasing/decreasing an abstraction level for the protocol specification.

Finally in “Validation of Railway Interlocking Systems by Model Based Testing, a Case Study” Bonacchi and Fantechi show how costly validation processes can be reduced during the production railway interlocking systems, by extracting a model of the implemented interlocking logic from the on-target description of the topology.

In “An automated testing framework of model-driven tools for XACML policy specification” Bertolino, Daoudagh, Lonetti and Marchetti consider instead the problem of testing the facilities for model-to-code translation. The authors face the problem considering the specific access control environment and propose an integrated framework for testing the automatic translation of the specification of an access control model into an XACML policy.

Discussion about the practical limitations of the different V&V proposals in real-word context is finally considered in “Combinatorial Testing in an Industrial Environment—Analyzing the Applicability of a Tool” Condori-Fernández, Kruse, Vos, Brosse and Bagnato. In particular the authors investigate the applicability of a combinatorial testing tool in

the company SOfTEAM discussing about efficiency, effectiveness and learning effort.

In summary, the QUATIC 2014 ICT Verification and Validation track accepted 4 papers and 2 works in progress covering different topics in Verification and Validation context. We are grateful to all those who submitted papers to this event and also the revising board who helped to improve the quality of the accepted papers and their selection on this track.

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