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# Structured Object-Oriented Formal Language and Method

9th International Workshop, SOFL+MSVL 2019
Shenzhen, China, November 5, 2019
Revised Selected Papers

Springer

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# Preface

In spite of extensive research on formal methods and many efforts on transferring the technology to industry over the last three decades, how to enable practitioners to easily and effectively use formal techniques still remains challenging. The Structured Object-Oriented Formal Language (SOFL) has been developed to address this challenge by providing a comprehensive specification language, a practical modeling method, various verification and validation techniques, and tool support through effective integration of formal methods with conventional software engineering techniques. SOFL integrates Data Flow Diagram, Petri Nets, and VDM-SL to offer a visualized and formal notation for constructing specification; a three-step approach to requirements acquisition and system design; specification-based inspection and testing methods for detecting errors in both specifications and programs; and a set of tools to support modeling and verification. The Modeling, Simulation and Verification Language (MSVL) is a parallel programming language. It enables users to model a system as an MSVL program, to execute the program for simulating the behavior of the system, and to verify properties of the system. Its supporting toolkit MSV including MSVL compiler, interpreter, and several types of model checkers has been developed for automatic program verification. In particular, to verify C and Verilog/VHDL programs in large scale, some translators such as C2M and V2M, and a run time verification tool in code level have also been built to facilitate modeling, simulating, and verifying large systems in a formal manner.

Following the success of the previous SOFL+MSVL workshops, the 9th International Workshop on SOFL+MSVL for Reliability and Security (SOFL+MSVL 2019) was jointly organized in Shenzhen with the aim of bringing together industrial, academic, and government experts and practitioners of SOFL or MSVL to communicate and to exchange ideas. The workshop attracted 43 submissions on specification-based testing, specification inspection, model checking, formal verification, formal semantics, and formal analysis. Each submission was rigorously reviewed by two or more Program Committee (PC) members on the basis of technical quality, relevance, significance, and clarity, and 23 papers were accepted for publication in the workshop proceedings. The acceptance rate was 53%.

We would like to thank ICFEM 2019 for supporting the organization of the workshop, all of the PC members for their great efforts and cooperation in reviewing and selecting the papers, and our postgraduate students for all their help. We would also like to thank all of the participants for attending presentation sessions and actively joining discussions at the workshop. Finally, our gratitude goes to the editors at Springer for their continuous support in publishing the workshop proceedings.

December 2019

Huaikou Miao
Cong Tian
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