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Editorial

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This Special Issue follows the 31st IFIP International Conference on Testing Software and Systems (IFIP-ICTSS). IFIP-ICTSS has become a traditional event of the WG 6.1 working group of the International Federation for Information Processing (IFIP). The conference was held in Paris, France, from October 15 to October 17, 2019.

IFIP-ICTSS is a series of international conferences addressing conceptual, theoretical, and practical problems of testing software systems, including communication protocols, services, distributed platforms, middleware, embedded and cyber-physical systems, and security infrastructures. It is a forum for researchers, developers, testers, and users. Its goal is to review, discuss, and learn about new approaches in the field of testing of software and systems. The topics of interest include new concepts, theories, methodologies, tools, and experience reports.

The authors of the papers accepted to ICTSS 2019 were invited to submit an extended version to this Special Issue. However, the call for papers was also open to external contributions.

After a rigorous selection process, 10 papers were accepted to appear in the Special Issue. They cover a large range of subjects such as test-case generation, testing in relation with artificial intelligence, proof and verification techniques, performance, and empirical studies and domain-specific applications.

The preparation of the Special Issue was strongly impacted by the COVID-19 pandemic. We would like to thank the authors for their contributions and the reviewers for their hard work on paper evaluation in this particularly uneasy period. We are also grateful to the Journal Editorial Office for their efficient support during the paper selection process.

We hope that the readers will find this Special Issue inspiring and challenging.

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Dr. Christophe Gaston is a senior researcher at CEA LIST. His research topics focus on formal methods using models. His field of expertise includes techniques such as model-based testing, symbolic execution and run-time verification as well methodological approaches based on formal frameworks, such as algebraic specifications, category theory, automata theory, process algebras, rewriting and various theories of conformance testing. His recent works focus on the application of such techniques to the verification of distributed systems. Christophe Gaston supervised 7 thesis in Formal methods. He is a member of several committees of international conferences and workshops including the International Conference on Testing Software and Systems (IFIP-ICTSS). He is a founding member of the Model-Driven Engineering Verification and Validation (MoDeVVa) workshop.

Dr. Nikolai Kosmatov works as an expert in software verification at Thales Research and Technology (Palaiseau, France) since 2019, where he focuses on applying various verification techniques and tools to industrial projects. He is also an invited researcher at CEA List, where he had previously worked for 13 years as an expert researcher at Software Safety and Security Lab. He obtained PhD in Mathematics in 2001 from St.Petersburg State Univ., MS in Computer Science in 2003 from Univ. of Besançon, and Habilitation in Computer Science (HDR) from Univ. Paris-Sud in 2018. His research interests include software testing, formal verification, combinations between static and dynamic analysis techniques and runtime verification. He co-authored 4 patents and more than 60 scientific papers in international conferences and journals. He was PC co-chair of several international events related to verification and testing, e.g. TAP 2015, IFIP-ICTSS 2019, ACM SAC-SVT 2020 and 2021. He is co-responsible for the working group on software testing (MTV2) of the French CNRS network on software engineering (GDR GPL) and organizes its annual workshops. Dr. Kosmatov contributed to the design and development of several software verification tools. He is the main author of the PathCrawler-online.com testing web service. Personal website: https://nikolai-kosmatov.eu/

Pascale Le Gall is a Full Professor in Computer Science at the CentraleSupélec engineering school of the University of Paris-Saclay. She leads the Logimics research team in MICS laboratory and the Doctoral School Interfaces of the Graduate School of Engineering and System Sciences. She supervises or has supervised more than 30 PhD students, is co-author of more than 70 international publications. She has a strong expertise in formal methods, Model-Based Testing (test case generation, verdict computation), graph transformations, symbolic execution technics and models for timed reactive distributed systems. She was PC co-chair of several international events related to verification and testing, e.g, IFIP-ICTSS 2019, ACM SAC-SVT 2022. She is co-responsible for the working group on software testing (MTV2) of the French CNRS network on software engineering (GDR GPL) and organizes its annual workshops.