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Silvia Bonfanti · George Angelos Papadopoulos
Editors

Testing Software and Systems

37th IFIP WG 6.1 International Conference, ICTSS 2025
Limassol, Cyprus, September 17–19, 2025
Proceedings

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Preface

It is our great pleasure to welcome you to the proceedings of the 37th IFIP WG 6.1 International Conference on Testing Software and Systems, ICTSS 2025, held in Limassol, Cyprus, from September 17th to September 19th, 2025. ICTSS is a long-standing series of international conferences addressing conceptual, theoretical, and practical problems of testing software systems. ICTSS 2025 addressed foundational, methodological, and applied aspects of testing and validation across traditional and emerging software systems, with a strong focus on automation, AI, formal methods, and real-world applications. The conference brought together researchers, developers, testers, and users from both academia and industry to present and discuss the latest innovations, experiences, and open challenges related to software testing and system validation. In this edition, we received 39 submissions. After an initial screening, 1 paper was desk-rejected. Each of the remaining submissions underwent a rigorous single-blind review, followed by an active discussion phase. As a result, we accepted 23 papers, categorized as follows: 18 regular papers, 4 short papers, and 1 industry contribution. We sincerely thank all members of the program committee for their thorough reviews, insightful discussions, and valuable contributions to ensuring the quality of the program. The selected papers in this volume are organized under the following topical themes: Foundations and Advanced Testing Techniques; Intelligent and Automated Testing; LLMs, Agents, and AI-Driven Testing; and Testing in Complex and Security-Critical Systems. We would like to acknowledge the support of IFIP (International Federation for Information Processing) for sponsoring ICTSS 2025, and Springer for publishing these proceedings. ICTSS 2025 was organised by the University of Cyprus, through the involvement of the SEIT Lab <https://www.cs.ucy.ac.cy/seit/>, an integral part of the Department of Computer Science. The University of Cyprus was the first university in the country and, despite its relatively young age (33 years of operation), features in the top 500 universities in international ranking lists (Times, QS). It is also in the top 8% of the so-called young universities (i.e. those up to 50 years of age).

We were very glad to have Bertrand Meyer as keynote speaker of ICTSS 2025. He presented a talk on The Future of Verification in the age of AI. We thank him for agreeing to give an invited presentation at IFIP-ICTSS 2025.

On behalf of the IFIP-ICTSS 2025 organizers, we hope you find these proceedings informative, thought-provoking, and a source of inspiration for future work.

September 2025

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Keynote

The Future of Verification in the age of AI

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Abstract. Software verification is more necessary than ever but is also more elusive than ever in an era when Artificial Intelligence systems take society by storm, with results at the same time often impressive, sometimes scary, seldom accompanied by guarantees, and occasionally prone to dangerous hallucinations. Even non-AI developments are increasingly produced through AI techniques such as vibe coding. This talk will review what software verification means for various communities in academia and research, and its interaction with AI both ways: verifying AI software, and using AI for verification. It serves both as a survey assessing the current state of the art and as an attempt as a roadmap for the future of AI-aware verification.

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