

Preface

Maurice H. ter Beek

Formal Methods and Tools (FMT) lab

Institute of Information Science and Technologies (ISTI)
National Research Council (CNR)
Pisa, Italy

`maurice.terbeek@isti.cnr.it`

Clemens Dubslaff

Formal System Analysis (FSA) group

Department of Mathematics and Computer Science
Eindhoven University of Technology
Eindhoven, The Netherlands

`c.dubslaff@tue.nl`

These post-proceedings contain a selection of papers presented at the *First Workshop on Trends in Configurable Systems Analysis (TiCSA)*, which took place on 23 April 2023 in Paris, France, as a satellite event of the 26th European Joint Conferences on Theory And Practice of Software (ETAPS 2023).

TiCSA’s primary goal was to bring together researchers active in the areas of design and analysis of configurable systems, discuss trends and novel analysis methods, and foster collaboration. Co-locating the workshop with ETAPS provided an excellent opportunity for exchanging results and experiences on applying analysis techniques from formal methods and software engineering to configurable systems.

System variants often arise by configuring parameters that have a direct impact on the system’s behavior. Most prominently, in feature-oriented system design, features describe optional or incremental system functionalities whose configuration is simply whether a feature is active or inactive. Since the configuration space usually suffers from an exponential blowup in the number of configuration parameters, such *configurable systems* require specialized methods for their design and analysis. While there have been significant advances for the analysis of configurable systems in the last decade, most prominently *family-based analysis* or *feature-based analysis*, tackling the exponential blowup, there are still manifold opportunities that have not yet been considered. These cover specialized algorithms concerning *quantitative* and *compositional* aspects, required to model and analyze cyber-physical systems, as well as *adaptivity* and *reconfigurations* that allow for system adaptations in context-aware system design.

TiCSA is a continuation and extension of the QAVS series, which comprised three workshops with a focus on quantitative aspects in configurable systems analysis. These workshops had to be unfortunately held online only due to the Covid crisis, and no proceedings were published in the three editions. Hence, these proceedings can be seen also the first in the workshop series. The first QAVS workshop was co-located with QONFEST 2020 and comprised six presentations with around 20 attendees. Sven Apel (Saarland University, Germany) and Axel Legay (UC Louvain, Belgium) were invited to give keynotes. The second QAVS workshop in 2021 was the first under the umbrella of ETAPS with four presentations and about 15 attendees. Norbert Siegmund (University of Leipzig, Germany) was the invited speaker. The third QAVS workshop was co-located with ETAPS 2022 with five presentations and around 15 attendees. Jan Křetínský (TU Munich, Germany) provided an invited keynote. The decision to broaden the scope of the workshop, by considering other trends in configurable systems analysis rather than quantitative aspects alone, arose from audience feedback and discussions during the last QAVS workshop at ETAPS 2022.

TiCSA received six extended abstract submissions, which were accepted for a presentation after being reviewed for suitability. The workshop was opened by a keynote talk by Étienne André (Sorbonne Paris North University, France) on *Configuring Timing Parameters to Ensure Opacity*. Furthermore,

Maurice H. ter Beek and Clemens Dubslaff (Eds.):

Proceedings of the First Workshop on Trends

in Configurable Systems Analysis (TiCSA’23)

EPTCS 392, 2023, pp. ii–iii doi:[10.4204/EPTCS.392.0](https://doi.org/10.4204/EPTCS.392.0)

This work is [dedicated to the public domain](#)

an inspiration talk by Alfons Laarman (Leiden University, The Netherlands) on *LIMDD – A Decision Diagram for Simulation of Quantum Computing* initiated a discussion around quantum configurable systems and configurable quantum systems, concluding the workshop. We hereby thank Étienne and Alfons for accepting our invitations and all authors who submitted their work for their contributions. After the workshop, we received three full papers for publication in these post-proceedings, all of which were accepted after having been reviewed by no less than four members of the program committee.

We would like to thank the program committee members, listed below, for their careful and swift reviewing. We are also grateful to the ETAPS workshop chairs, Benedikt Bollig and Stefan Haar (Paris Saclay University, France), for accepting TiCSA as a satellite event at ETAPS 2023 and to the latter's general chairs Fabrice Kordon (Sorbonne University, France) and Laure Petrucci (Sorbonne Paris North University, France) and their team for the smooth organization and the pleasant interaction concerning organizational matters. We would also like to take this opportunity to thank EasyChair, which automates most of the tasks involved in organizing and chairing a workshop. Finally, we thank EPTCS and its editor-in-chief, Rob van Glabbeek, for agreeing to publish the proceedings of TiCSA 2023.

Program Chairs

Maurice ter Beek (ISTI–CNR, Pisa, Italy)

Clemens Dubslaff (Eindhoven University of Technology, The Netherlands)

Program Committee

Sven Apel (Saarland University, Germany)

Davide Basile (ISTI–CNR, Pisa, Italy)

Philipp Chrszon (German Aerospace Center, Braunschweig, Germany)

Erik de Vink (Eindhoven University of Technology, The Netherlands)

Uli Fahrenberg (LIX, Palaiseau, France)

Sebastian Junges (Radboud University Nijmegen, The Netherlands)

Jan Křetínský (Technical University of Munich, Germany)

Axel Legay (UC Louvain, Belgium)

Alberto Lluch Lafuente (Technical University of Denmark)

Tatjana Petrov (University of Konstanz, Germany)

José Proença (CISTER, Polytechnic Institute of Porto, Portugal)

Genáina Rodrigues (University of Brasília, Brazil)

Christoph Seidl (IT University of Copenhagen, Denmark)

Thomas Thüm (University of Ulm, Germany)

Andrea Vandin (Sant'Anna School of Advanced Studies, Pisa, Italy)

Mahsa Varshosaz (IT University, Copenhagen, Denmark)