

31st International Conference on Concurrency Theory

CONCUR 2020, September 1–4, 2020, Vienna, Austria
(Virtual Conference)

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ACM Classification 2012

Theory of computation → Concurrency

ISBN 978-3-95977-160-3

Published online and open access by

Schloss Dagstuhl – Leibniz-Zentrum für Informatik GmbH, Dagstuhl Publishing, Saarbrücken/Wadern, Germany. Online available at <https://www.dagstuhl.de/dagpub/978-3-95977-160-3>.

Publication date

August, 2020

Bibliographic information published by the Deutsche Nationalbibliothek

The Deutsche Nationalbibliothek lists this publication in the Deutsche Nationalbibliografie; detailed bibliographic data are available in the Internet at <https://portal.dnb.de>.

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Digital Object Identifier: 10.4230/LIPIcs.CONCUR.2020.0

ISBN 978-3-95977-160-3

ISSN 1868-8969

<https://www.dagstuhl.de/lipics>

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■ Preface

This proceedings volume contains peer-reviewed contributions accepted at the 31st International Conference on Concurrency Theory (CONCUR), 2020.

The CONCUR conference series brings together researchers, developers, and students in order to advance the theory of concurrency, and promote its applications. Amid the COVID-19 situation, CONCUR 2020 could not take place at TU Wien (Vienna, Austria), as it was originally planned. Instead it was organized as a virtual conference, as part of the umbrella conference QONFEST 2020. In addition to CONCUR 2020, the QONFEST 2020 comprised also the 25th International Conference on Formal Methods for Industrial Critical Systems (FMICS) 2020, the 18th International Conference on Formal Modeling and Analysis of Timed Systems (FORMATS) 2020 and the 17th International Conference on Quantitative Evaluation of SysTems (QEST) 2020, alongside with several workshops and tutorials.

Despite the COVID-19 crisis, we have received a high number of submissions. Out of 112 submissions, we have accepted 45 papers for presentation at CONCUR 2020. Given great quality of many submissions, the acceptance bar was quite high. The quality criteria for acceptance were very strict and we thank our program committee and external reviewers for their excellent job in reviewing the CONCUR 2020 submissions. We are especially very grateful to all our reviewers for their efforts in providing high-quality and timely reviews and conducting active discussions on each submission at CONCUR 2020.

We thank the authors of our proceeding's papers for repaying the efforts of our reviewers and submitting their revised works to the CONCUR 2020 proceedings. We hope that details of the papers included in the present proceedings will bring lively discussions within the virtual conference platform of CONCUR 2020, initiating new research directions and collaboration within the CONCUR scientific community and beyond.

In addition to the exceptional papers accepted at CONCUR 2020, the proceedings also include four invited papers accompanying the works presented by our invited speakers at CONCUR 2020. The invited talk by Prof. Annabelle McIver (Macquarie University, Australia) served as a plenary keynote talk of QONFEST 2020, whereas the invited talks by Prof. Roderick Bloem (TU Graz, Austria) and Prof. Thomas A. Henzinger (IST Austria) were shared with other QONFEST 2020 conferences, including FMICS 2020, FORMATS 2020, and QEST 2020. We are also delighted to have had Prof. Catuscia Palamidessi (INRIA Saclay and LIX, France) as our invited speaker discussing recent applications of game theory in the fields of machine learning and privacy, topics that are of core interests for the CONCUR community.

Starting with CONCUR 2020, we are also happy to announce the CONCUR Test-of-Time (ToT) Award series, established by the CONCUR conference and the IFIP 1.8 Working Group on Concurrency Theory. The purpose of this award is to recognize important achievements in Concurrency Theory that were published at CONCUR conferences and have stood the test of time. All papers published in CONCUR between 1990 and 1995 were eligible for the CONCUR ToT Award 2020. The award winners for the CONCUR ToT Awards 2020 have been selected by a Jury composed of Prof. Luca Aceto (Chair), Prof. Jos Baeten, Prof. Patricia Bouyer-Decitre, Prof. Holger Hermanns, and Prof. Alexandra Silva. The results and winners of the CONCUR ToT Award 2020 selection process are described in the invited contribution of Prof. Luca Aceto in these proceedings.

31st International Conference on Concurrency Theory (CONCUR 2020).
Editors: Igor Konnov and Laura Kovács



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We finally would like to thank Interchain Foundation (Switzerland) for its generous sponsorship for running CONCUR 2020. We also gratefully acknowledge the sponsorship of the Vienna Center for Logics and Algorithms - VCLA and the TU Wien, as well as the FORSYTE research group of the Faculty of Informatics of the TU Wien. We finally thank the EasyChair conference management system for assisting us in the reviewing and organization process of CONCUR 2020 together with QONFEST 2020.

As usual, the CONCUR 2020 proceedings are open access thanks to the LIPIcs series. We thank the authors of CONCUR 2020 papers, the CONCUR 2020 participants, as well as the organizers and student volunteers of CONCUR 2020 for making CONCUR 2020 a successful virtual event.

Igor Konnov and Laura Kovács
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CONCUR Test-Of-Time Award 2020 Announcement

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Abstract

This short article announces the recipients of the CONCUR Test-of-Time Award 2020.

2012 ACM Subject Classification Theory of computation → Concurrency

Keywords and phrases Concurrency, CONCUR Test-of-Time Award

Digital Object Identifier 10.4230/LIPIcs.CONCUR.2020.5

Category Invited Paper

Acknowledgements We thank Javier Esparza (chair of the CONCUR Steering Committee), Ilaria Castellani and Mohammad Reza Mousavi (chair and secretary of the IFIP Working Group 1.8 on Concurrency Theory), and Igor Konnov and Laura Kovacs (chairs of the CONCUR 2020 Program Committee) for their assistance throughout our work.

1 Introduction

The International Conference on Concurrency Theory (CONCUR) and the IFIP Working Group 1.8 on Concurrency Theory have established the CONCUR Test-of-Time Award to recognize important achievements in Concurrency Theory that were published at the CONCUR conference and have stood the test of time. All papers published at CONCUR between 1990 and 1995 were eligible for the first installment of the award, which was presented at the 31st International Conference on Concurrency Theory (CONCUR 2020). The conference was held on line from Vienna, Austria, in the period 1–4 September 2020, with Igor Konnov and Laura Kovacs as chairs of the program committee.

We had the great honour to serve as members of the first CONCUR Test-of-Time Award Jury, and were asked by the CONCUR Steering Committee to select one or two awardees for the periods 1990–1993 and 1992–1995.

After having made a shortlist of candidate award recipients for each of the above-mentioned periods and having thoroughly discussed their relative merits and impact on the CONCUR research community and beyond, the Jury unanimously selected the four articles mentioned below for the award out of a slate of many excellent candidates.



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31st International Conference on Concurrency Theory (CONCUR 2020).

Editors: Igor Konnov and Laura Kovács; Article No. 5; pp. 5:1–5:3

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2 The Award Winning Contributions

2.1 Period 1990–1993

- Rob van Glabbeek. “The Linear Time-Branching Time Spectrum”.
Citation: The companion papers on “The Linear Time-Branching Time Spectrum”, published by Rob van Glabbeek at CONCUR 1990 and 1993, jointly receive one award for offering a highly influential taxonomy of the menagerie of process semantics, both in a setting where every system action is observable and in the presence of silent moves. Each of the plethora of studied semantics comes equipped with a variety of elegant characterisations in terms of modal logics, testing scenarios, relations, and complete axiomatisations. The encyclopedic nature of the above-mentioned papers has made them a must read for researchers in concurrency theory for nearly 30 years.
- Søren Christensen, Hans Hüttel and Colin Stirling. “Bisimulation Equivalence is Decidable for all Context-Free Processes”.
Citation: The paper “Bisimulation Equivalence is Decidable for all Context-Free Processes”, published by Søren Christensen, Hans Hüttel and Colin Stirling at CONCUR 1992, receives one award for extending and simplifying the seminal result by Baeten, Bergstra and Klop, who proved the decidability of bisimilarity over normed context-free processes. The CONCUR 1992 paper has paved the way to further decidability and complexity results for a variety of classes of infinite-state processes. This includes the 2-EXPTIME algorithm for bisimilarity over BPA presented by Burkart, Caucal and Steffen in a paper published at MFCS 1995, and the work by Senizergues in papers at FOCS 1998 and in the SIAM Journal on Computing in 2005, presenting decidability results for all “equational graphs” with finite out-degree.

2.2 Period 1992–1995

- Roberto Segala and Nancy Lynch. “Probabilistic Simulations for Probabilistic Processes”.
Citation: The paper “Probabilistic Simulations for Probabilistic Processes”, published by Roberto Segala and Nancy Lynch at CONCUR 1994, receives one award for introducing the “simple” probabilistic automata model. Unlike earlier attempts to embrace probabilities, transition targets here are probability distributions over states, and this makes it possible to lift core process algebraic results in a very elegant manner. Probabilistic automata have quickly been recognised as the pivotal link between classical concurrency theory and the theory of discrete-state Markov processes. They have become the central subjects of probabilistic model checking, and are echoed in a range of very influential modelling formalisms including probabilistic timed automata, probabilistic hybrid automata, and Markov automata.
- Davide Sangiorgi. “A Theory of Bisimulation for the pi-Calculus”.
Citation: The paper “A Theory of Bisimulation for the pi-Calculus”, published by Davide Sangiorgi at CONCUR 1993, receives one award for introducing the notion of open bisimilarity, which, unlike early and late bisimilarity, is a congruence for the pi-calculus. Open bisimilarity makes it possible to view most names as uninstantiated variables, and this allows for the development of efficient tools based on a kind of symbolic state-space exploration. Open bisimilarity and tools based on it have, for instance, played an important role in research on cryptographic protocols modelled using extensions of the pi-calculus. For a recent example, Horne has used open bisimilarity as the appropriate way to model the capabilities of an attacker trying to get confidential information, with a real-world application to finding and fixing a privacy flaw in e-passports presented by Filimonov et al. at ESORICS 2019.

3 Concluding Remarks

Interviews with the award recipients, which give some information on the historical context that led them to develop their award-winning work and on their research philosophy, may be found in four blog posts that are accessible from <https://processalgebra.blogspot.com/>, and are collected under one roof in a contribution to the June 2020 issue of the Bulletin of the EATCS [1].

We hope that researchers in Concurrency Theory will read or re-read the award-winning papers and the others that were presented at the early editions of the CONCUR conference, which are a veritable treasure trove of information about our field's intellectual heritage and of inspiration for future work.

References

- 1 Luca Aceto. Interviews with the 2020 CONCUR Test-of-Time Award recipients. *Bulletin of the EATCS*, 131:66–84, 2020. URL: <http://bulletin.eatcs.org/index.php/beatcs/article/view/626>.