

Concurrency, Specification, and Programming: Special Issue of Selected Papers of CS&P 2018

Preface

This special issue contains articles selected from CS&P 2018, the 27th Workshop on Concurrency, Specification, and Programming. CS&P deals with formal specification of concurrent and parallel systems, mathematical models for describing such systems, and programming and verification concepts for their implementation. The workshop is one of a series of events organised every even year by Humboldt University of Berlin and every odd year by Warsaw University. Dating back to the mid-seventies, CS&P has become an important forum for researchers from European and Asian countries. CS&P 2018 was held at Humboldt University Berlin-Adlershof, Germany, in September 24-26, 2018, and featured 20 papers accepted for presentation by the program committee. After the conference, six outstanding papers were selected by the Steering Committee based on the previous reviews and the quality of the presentations. Their authors were given time to integrate the reviewer's and audience's feedback, as well as to substantially improve and extend their contributions. After the second round of reviewing by additional experts, during the pandemic year of 2020 the authors polished and finalized their contributions, to yield the mature articles which can be found in this special issue.

Roughly, the articles in this special issue can be grouped into the two research areas of “models of concurrency” and “rough sets”.

Ludwik Czaja presents extensions of the classical elementary cause-effect structures by weighted edges, multi-valued nodes having capacities, inhibitors and timing, including an application to the music of Frederic Chopin.

Samira Akili and Matthias Weidlich propose multi-sink evaluation graphs as a formal computational model to evaluate complex event processing queries in a distributed manner, and show how to assess correctness and completeness of query evaluation under this model.

Sinem Getir Yaman, Esteban Pavese, and Lars Grunske give a model checking algorithm for stochastic regular expressions over a new probabilistic action-based computation tree logic and demonstrate its correctness and applicability for quantitative verification.

Adam Grabowski considers some generalized rough approximations of sets and presents formal and machine-checked proofs of essential properties of these models.

Piotr Artiemjew and Krzysztof Ropiak consider another extension of classical set theory, random granular reflections as ensembles of homogeneous granular decision systems for machine learning of classifications.

Finally, Roberto Barbuti, Roberta Gori, Francesca Levi, Pasquale Bove, Damas Gruska, and Paolo Milazzo analyse gene regulatory networks, which are used to model the interactions among genes in living cells, by translating threshold boolean networks into classical reaction systems, and apply this for the simulation of processes in yeast cells and bacteria.

We thank the authors of the articles for their additional effort in extending and revising their conference papers. Moreover, we would like to thank the reviewers and PC members of CS&P 2018 for their comments during the selection process, and the reviewers of this special issue for their careful work and detailed reviews, which resulted in high-quality contributions.

Finally, we would like to thank Damian Niwiński and Sławomir Lasota for giving us the opportunity to publish this special issue and the publishing team at Fundamenta Informaticae for their practical support.

Berlin and Warsaw, February 2021

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