

## **Preface by Editor-in-Chief**

The 10th Issue of LNCS Transactions on Petri Nets and Other Models of Concurrency (ToPNoC) contains revised and extended versions of a selection of the best papers from the workshops held at the 35th International Conference on Application and Theory of Petri Nets and Concurrency (Petri Nets 2014, Tunis, Tunisia, 23–27 June 2014), and the 14th International Conference on Application of Concurrency to System Design (ACSD 2014, Tunis, Tunisia, 23–27 June 2014). It also contains one paper submitted directly to ToPNoC.

I would like to thank the two guest editors of this special issue: Jörg Desel and Serge Haddad. Moreover, I would like to thank all authors, reviewers, and the organizers of the Petri Nets 2014 and ACSD 2014 satellite workshops, without whom this issue of ToPNoC would not have been possible.

July 2015

Maciej Koutny

## Preface by Guest Editors

This volume of ToPNoC contains revised and extended versions of a selection of the best workshop papers presented at the 35th International Conference on Application and Theory of Petri Nets and Other Models of Concurrency (Petri Nets 2014) and the 14th International Conference on Application of Concurrency to System Design (ACSD 2014).

We, Jörg Desel and Serge Haddad, are indebted to the Program Committees of the workshops and in particular to their chairs. Without their enthusiastic work, this volume would not have been possible. Many members of the Program Committees participated in reviewing the new versions of the papers selected for this issue. We asked for the strongest contributions of the following workshops:

- PNSE 2014: International Workshop on Petri Nets and Software Engineering (chairs: Daniel Moldt, Heiko Rölke)
- FMS 2014: International Workshop on Formal Methods for Security (FMS) (chairs: Véronique Cortier, Riadh Robbana)
- BioPPN 2014: International Workshop on Biological Processes and Petri Nets (chairs: Alia Benkahla, Monika Heiner)

The best papers of these workshops were selected in close cooperation with their chairs. The authors were invited to improve and extend their results where possible, based on the comments received before and during the workshops. The resulting revised submissions were reviewed by three referees. We followed the principle of asking for fresh reviews of the revised papers, i.e., from referees who had not been involved initially in reviewing the original workshop contributions. All papers went through the standard two-stage journal reviewing process, and eventually seven were accepted after rigorous reviewing and revising. This volume contains a variety of high-quality contributions, covering specification, validation, verification, and synthesis of Petri nets and other models of concurrency.

The paper “Verification of Logs - Revealing Faulty Processes of a Medical Laboratory” by Robin Bergenthum and Joachim Schick presents a case study showing a systematic approach to revealing faulty processes in a medical laboratory. This approach consists in (1) extracting a sample of the data, (2) formalizing it with the language of the information system, (3) distinguishing between valid and faulty words, and (4) building a Colored Petri net that accepts the valid words. In addition, this Colored Petri net is translated into a PL/SQL-program.

The paper “An Everlasting Secure Non-interactive Timestamping Scheme in the Bounded Storage Model” by Assia Ben Shil and Kaouther Blibech Sinaoui provides a non-interactive timestamping scheme for models where an adversary has limited memory but potentially unlimited computing power. Thus, the security of their timestamping scheme does not depend on the lifetime of any cryptographic technique. More precisely, the authors prove that this timestamping scheme is eternally secure, even against an adversary with unlimited computing power.

The paper “Timed Aggregate Graph: A Finite Graph Preserving Event- and State-Based Quantitative Properties of Time Petri Nets” by Kais Klai defines an abstraction of the behavior of Time Petri nets in the form of a finite graph. The author proves that this graph preserves timed traces and reachable states of a Time Petri net and provides an algorithm that maps abstract runs of Timed Aggregate Graphs to explicit runs of the corresponding Time Petri net. The graph can also be used to check event- and state-based properties as well as the Zenoness property, i.e., the existence of a run with infinitely many events in finite time.

The paper “SMT-based Abstract Parametric Temporal Planning” by Atur Niewiadomski and Wojciech Penczek extends the abstract planning phase of an approach to solve the web service composition problem, as implemented in the Planics tool. In this phase, the tool composes service types. The paper provides a theory for this phase and a new module for parametric temporal planning. For applying this module, the user query is extended with object variables and with a  $PLTL^z_X$  formula, specifying temporal aspects of world transformations in a plan. The paper not only provides the theory and the implementation, but also experimental results.

The paper “Kleene Theorems for Synchronous Products with Matching” by Ramchandra Phawade and Kamal Lodaya studies relations between subclasses of Petri nets, products of automata, and syntactic expressions. The authors define a specific composition of automata such that the corresponding Petri nets are live and one-bounded labelled free-choice nets. For the converse direction, a particular property of the nets is necessary, roughly stating that conflicts of the net are deterministic, i.e., that every two transitions in conflict are labelled differently. The behavior of these composed automata (nets, respectively) in terms of expressions requires the Kleene operator, which refers to the repetitive behavior of the models. The main results are so-called Kleene Theorems for a subclass of free-choice Petri nets.

The paper “Symbolic Model Checking of Security Protocols for Ad Hoc Networks on Any Topologies” by Mihai Lica Pura and Didier Buchs presents the use of AIPiNA, a symbolic model checker based on Algebraic Petri nets, for modeling ad hoc networks and for verifying security protocols designed for this type of networks. More precisely, the authors study the ARAN secure routing protocol and manage to find all the attacks that were previously reported for this protocol.

The paper “Symbolic Search of Insider Attack Scenarios from a Formal Information System Modeling” by Amira Radhouani, Akram Idani, Yves Ledru, and Narjes Ben Rajeb deals with internal attacks on information systems, i.e., attacks by people from inside the organization. The authors propose to model functional requirements and their Role Based Access Control (RBAC) policies using B machines, and then to formally reason on both models. Combining an analysis of symbolic behaviors with a model-checking tool allows us to find an observable concrete sequence of operations that can be performed by an attacker.

As guest editors, we would like to thank all authors and referees who have contributed to this issue. The quality of this volume is the result of the high scientific value of their work. Moreover, we would like to acknowledge the excellent cooperation throughout the whole process that has made our work a pleasant task.

We are also grateful to the Springer/ToPNoC team for the final production of this issue.

June 2015

Jörg Desel  
Serge Haddad

Transactions on Petri Nets and Other Models of  
Concurrency X

Koutny, M.; Desel, J.; Haddad, S. (Eds.)

2015, XV, 177 p. 41 illus. in color., Softcover

ISBN: 978-3-662-48649-8