

Workshop Proceedings

2nd Workshop on

Application of Region Theory (ART)

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Satellite event of the conferences

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Application of Concurrency to System Design (ACSD 2011)

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Application and Theory of Petri Nets (PETRI NETS 2011)

Edited by Jörg Desel and Alex Yakovlev

Preface

Regions have been defined about 20 years ago by Andrzej Ehrenfeucht and Grzegorz Rozenberg as sets of nodes of a finite transition system that correspond to potential conditions that enable or disable transition occurrences in a corresponding elementary net system. Thus, regions have been the essential concept for synthesis of an elementary net systems from its anonymous state graph (states are unknown but transitions between states are known). Since that time, many generalizations and variants of the synthesis problem of Petri nets from behavioral descriptions have been studied, including synthesis of more general Petri net classes, synthesis from languages, synthesis from partially ordered runs and synthesis from incomplete behavioral descriptions. All this work has in common that the transition names are given more or less directly by the behavioral description. The places of the net to be synthesized always correspond to regions which are defined in many different ways, depending on the form of the behavioral description. A main issue in this research is the study of regions, whence we call the entire research direction region theory.

Region Theory was applied in many different areas such as

- hardware synthesis from precise specifications (synthesis from transition systems)
- visualization of concurrent hardware behavior (synthesis from logic circuit models, transition systems and partial orders)
- GALS synthesis and desynchronisation based on synthesis (synthesis from step transition systems and re-synthesis from Petri nets)
- synthesis of control and policies for discrete event systems (synthesis from both languages and transition systems)
- modelling biological (membrane) systems with localities (synthesis from step transition systems)
- generation of specifications from incomplete specifications (mining from transition systems)
- model generation from examples (specification from (partial) languages)
- mining of process descriptions (mining from languages)

The aim of the ART workshop series was to bring together people working in these or other application areas of region theory, to exchange ideas and concepts and to work on common workshop results.

This proceedings volume contains reviewed contributions submitted to and presented at the 2nd ART workshop.

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Table of Content

Jetty Kleijn, Maciej Koutny, Marta Pietkiewicz-Koutny and Grzegorz Rozenberg <i>Classifying Boolean Nets for Region-based Synthesis</i>	5
Josep Carmona <i>The Label Splitting Problem</i>	22
Boudewijn van Dongen, Jörg Desel and Wil van der Aalst <i>Aggregating Causal Runs into Workflow Nets</i>	36
Robin Bergenthum and Sebastian Mauser <i>Folding Partially Ordered Runs</i>	52
Philippe Darondeau and Laurie Ricker <i>Towards Distributed Control of Discrete-Event Systems</i>	63
Robin Bergenthum and Sebastian Mauser <i>Mining with User Interaction</i>	79
Wil van der Aalst <i>Do Petri Nets Provide the Right Representational Bias for Process Mining?</i> ...	85

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