Available online at www.sciencedirect.com
SCIENCE DIRECT
Electronic Notes in Theoretical Computer Science
ELSEVIER
Electronic Notes in Theoretical Computer Science
www.elsevier.com/locate/entcs

Preface

UNIGRA'03 - Uniform Approaches to Graphical Process Specification Techniques

Roswitha Bardohl andHartmut Ehrig

Abstract

This volume contains selected papers of the proceedings of the workshop on *Uniform Approaches to Graphical Process Specification Techniques* (UNIGRA'03). The workshop was held in Warsaw, Poland, on April 5 and 6, 2003, as a satellite event of the sixth European Joint Conference on Theory and Practice of Software (ETAPS 2003). The workshop continues the UNIGRA workshop in 2001 which has been a successful satellite event of ETAPS 2001.

Workshop Objectives

Due to the increasing amount of divergent formalisms, the main idea of the UNIGRA workshops is to bring together people working especially in the following three areas:

Low Level and High-Level Petri Nets

Graph Transformation and High-Level Replacement Systems

Visual Modeling Techniques including UML

In each of these areas there is a large variety of different approaches, however, first attempts for uniform approaches have been made already. According to the main idea and in order to further stimulate the research in this important area, this volume presents some uniform approaches and further introduce unifying and comparative studies across the borders of the three and related areas.

Workshop Program

In the first part, unifying approaches for low-level and high-level Petri nets are proposed:

The contribution by Ehrig shows how the notions *occurrence net*and *process* can be generalized from low-level to high-level Petri nets, and studies the behavior and instantiations of this new view of processes for high-level nets.

In his overview on new developments in the area of Petri net transformations for Software Engineering, Urbášek presents recent work on net model transformations and net class transformations. Both kinds of transformations are studied with regard to the preservation of system properties such as safety properties or liveness. The formalization of Petri net transformations is originally based on the theory of graph transformation.

Padberg considers a case study (the call center of a phone company)which is modeled using Petri net modules for structuring the operational behavior of the system. The notion of Petri net modules was achieved by a transfer from the concepts of algebraic module specifications to the modeling of component-based systems by Petri nets.

Desel, Juhás and Lorenz deal with the semantics of place/transition nets. The authors relate the process semantics based on partial orders (individual token semantics) to the collective token semantics by defining partial orders associated to process terms of place/transition nets.

1571-0661
10.1016/S1571-0661(05)80754-6

In the second part concerning graph transformation and high-level replacement systems, new aspects of component modeling and application of graph transformation techniques are discussed:

In their contribution on components for algebra transformation systems, Ehrig and Orejas define a component transformation semantics in terms of the semantics of the specifications included in the components. The underlying formal basis of the instantiation of their generic component framework are algebra transformation systems and high-level replacement rules.

An application of the formal unifying framework of distributed transformation units is presented by Kuske and Knirsch. The authors illustrate how different features of agent systems can be modeled by distributed graph transformation systems in a uniform way.

Another application for graph rewriting, presented by Van Eetvelde and Janssens, is the modeling of refactoring operations for programs. The authors propose a hierarchical graph representation for programs to facilitate the study of refactoring operation effects at class level.

The third part contains contributions focusing on unifying concepts for visual modeling techniques including UML:

Minas describes a graphical specification tool for DIAGEN, a diagram editor generator based on hypergraph transformation. The specification tool simplifies the specification and generation of diagram editors. It uses an XML-based specification language and comes with a generic XML editor.

In his contribution on dynamic aspects of visual modeling languages, Bottoni proposes an approach to the definition of the syntax and semantics of visual languages based on a notion of transition of production/consumption of resources. Abstract meta-models for this notion of transition are presented.

An approach to the model-based verification and validation of properties of UML models is presented by Engels, Kïster, Heckel and Lohmann. The authors use graph transformation techniques as a meta-language for the translation and analysis of models.

In model-driven architectures, the problem arises to deal with multiple models. Kent and Smith focus in their contribution on bidirectional mappings between models for software requirements and models for software design as basis for tools checking model traceability and consistency.

Program Committee

The following program committee of UNIGRA'03 has given valuable scientific support:

Hartmut Ehrig (TU Berlin, Germany) [chair]

Roswitha Bardohl (TU Berlin, Germany) [co-chair]

Luciano Baresi (University of Milano, Italy)

Paolo Bottoni (University of Pisa, Italy)

Claudia Ermel (TU Berlin, Germany)

Reiko Heckel (University of Paderborn, Germany)

Dirk Janssens (University of Antwerp, Belgium)

Stuart Kent (University of Kent, Great Britain)

Hans-Jörg Kreowski (University of Bremen, Germany)

Fernando Orejas (University of Catalunya, Espania)

Julia Padberg (University of Bremen, Germany)

Grzegorz Rozenberg (University of Leiden, The Netherlands)

Acknowledgement

This workshop is supported by the European research training network *SegraVis*, and by the steering committee of the International Conference on Graph Transformation (ICGT).

June 2003, Roswitha Bardohl and Hartmut Ehrig