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ICGT 2012 was the sixth International Conference on Graph Transformation, held at the University of Bremen in September 2012 under the auspices of the European Association of Theoretical Computer Science (EATCS), the European Association of Software Science and Technology (EASST), and the IFIP Working Group 1.3, Foundations of Systems Specification. ICGT 2012 continued the series of conferences previously held in Barcelona (Spain) in 2002, Rome (Italy) in 2004, Natal (Brazil) in 2006, Leicester (UK) in 2008, and in Enschede (The Netherlands) in 2010 following a series of six International Workshops on Graph Grammars and Their Application to Computer Science from 1978 to 1998.

The conference motto was “Modeling and Analysis of Dynamic Structures”. Dynamic structures are the predominant concept for modeling and understanding complex problem situations. They consist of elements and interrelations which either may be added or removed, or may change their state. Dynamic structures are used in many computer science disciplines as the fundamental modeling approach. Examples are software architectures, software models, program structures, database structures, communication and network structures, or artifact versions and configurations. These structures are dynamic as they may be changed at design time or at runtime. These changes are known as, e.g., architectural refactorings, model transformations, or artifact evolutions. In the case of executable descriptions, dynamic structures are also used as semantic domains or as computational models for formal specification approaches, providing in this way means to formally analyze dynamic structures for certain predefined or user-defined properties.

All these approaches rely on the same uniform structure of graphs as well as on graph transformations to describe their dynamic behavior. Both aspects of graphs and graph transformations have been studied for more than 40 years by the graph grammar and graph transformation community. The conference aims at fostering this community as well as attracting researchers from other research areas to join the community. This could happen by contributing to the theory of graph transformation or by applying graph transformations to already known or novel application areas. Examples are self-adaptive systems, virtual structures in cloud computing, or advanced computational models such as models for DNA computing.

The conference program was split into the foundations track and the applications track with separate program committees, in order to yield a high-quality conference program covering all aspects of graph transformations. The proceedings of ICGT 2012 consist of three invited papers and 24 contributions, which were selected following a thorough reviewing process. Moreover, the three presentations accepted for the Doctoral Symposium are documented by extended abstracts.
The volume starts with the invited papers. The further papers are divided into the foundations track and the applications track. The foundations track consists of 15 papers subdivided into the thematic topics behavioral analysis, high-level graph transformation, revisited approaches, general transformation models, and structuring and verification while the applications track consists of nine papers subdivided into the thematic topics graph transformations in use, (meta-)model evolution, and incremental approaches. The volume ends with the abstracts of the presentations given at the Doctoral Symposium.

We are grateful to the University of Bremen for hosting ICGT 2012, and would like to thank the members of the organization committee and of the two program committees as well as the subreviewers. Particular thanks go to Andrea Corradini and Gabriele Taentzer for organizing the Doctoral Symposium as part of the conference. Moreover, according to the tradition of the ICGT series, three satellite workshops were organized:

− 7th International Workshop on Graph Based Tools (GraBaTs 2012) organized by Christian Krause and Bernhard Westfechtel,
− 4th International Workshop on Graph Computation Models (GCM 2012) organized by Rachid Echahed, Annegret Habel, and Mohamed Mosbah, and
− 5th International Workshop on Petri Nets, Graph Transformation and other Concurrency Formalisms (PNGT 2012) organized by Kathrin Hoffmann and Julia Padberg.

We are also grateful to Marcus Ermler, Melanie Luderer, and Caroline von Totth for their help in editing this volume. Finally, we would like to acknowledge the excellent support throughout the publishing process by Alfred Hofmann and his team at Springer, and the helpful use of the EasyChair and ConfTool conference management systems.

July 2012

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