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Preface

The area of graph transformation originated in the late 1960's and has been systematically developed since then in the vicinity of formal language theory, algorithmic graph theory, the theory of term rewriting, the theory of parallel, concurrent and distributed systems, formal methods, verification, logic, and semantics. It is well motivated by considerations and problems in all applied fields where static and dynamic modeling by means of graphical structures play an important role such as visual languages, object-oriented modeling, software engineering, computer graphics, functional and logic programming, systems specification, database design, and many others.

In October 2002, the first International Conference on Graph Transformation (ICGT 2002) was held in Barcelona, Spain, following a series of six international workshops starting in 1978 and taking place every four years. The scope of the conference concerned graphical structures of various kinds like graphs, diagrams, networks, and visual sentences that are useful to describe complex structures and systems in a direct and intuitive way. These structures are often augmented by formalisms allowing for the modeling of the evolution of systems via all kinds of transformations of such graphical structures. The field of graph transformation is devoted to the theory, applications, and implementation issues of such formalisms.

In this special issue of Fundamenta Informaticae, the reader finds three selected full papers based on contributions to ICGT 2002.

In the first paper, Szilvia Gyapay, Reiko Heckel, and Dániel Varró introduce the very first approach to *Graph Transformation with Time*. The concept is oriented to the modeling of time in high-level Petri nets. The main result ensures the consistency of temporal order and causal dependencies.

In the second paper, Jurriaan Hage, Tero Harju, and Emo Welzl study *Euler Graphs, Triangle-free Graphs and Bipartite Graphs in Switching Classes*. Switching is a particular transformation of graphs yielding an exponential class for each graph. Nevertheless, it is shown in the paper that graphs of the three special types listed in the title can be detected as members of switching classes in polynomial time.

Finally, the third paper, authored by Berthold Hoffmann, concerns *Abstraction and Control for Shapely Nested Graph Transformation*. This kind of graph transformation provides the computational model of DIAPLAN, a language for programming with diagrams (that are represented by graphs). This computational model is extended by two important programming concepts.

Altogether, the three papers give a good insight into the spectrum of topics addressed and methods used in the foundation of graph transformation.

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