APPLICATION OF GRAPH GRAMMAR SYSTEMS FOR
VERIFICATION OF UML DIAGRAMS

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Abstract

Business processes are highly dynamic, distributed and can only rarely be planed, modeled and analyzed completely. In recent years, the Unified Modeling Language UML has been widely accepted as the standard language for modeling and documenting software systems. Due to the missing formal, mathematical foundation of UML the syntax and the semantics of number of UML constructs are not precisely defined. In this paper we outline a proposal for the formal foundation of UML that is based on Graph Grammars and Graph Transformation Systems. Graphs are well–known, well–understood, and frequently used means to represent systems state, complex object, Petri nets, entity–relationship diagrams, and any more. Graph transformation consists of applying a rule to a graph and iterating this process. The application of rules may result in non-determinism. In this paper we propose the use of control structures to specify the execution sequence of rules. This control sequence has to guarantee the completeness and correctness of model transformation being checked by a suitable formal mathematical methods.