Generation of Formal Model Metrics for MOF based Domain Specific Languages

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Abstract

The assessment of quality in a software development process is vital for the quality of the final system. A number of approaches exist, which can be used to determine such quality properties. In a model-driven development process models are the primary artifacts. Novel technologies are needed in order to assess the quality of those artifacts. Often, the Object Constraint Language is used to formulate model metrics and to compute them automatically afterwards. This paper describes an approach for the generation of model metrics expressed as OCL statements based on a set of generic rules. These rules can be applied on any domain specific modeling languages for creating a basic set of metrics which can be tailored for the specific needs of a development process. The paper also briefly describes a prototype of a tool for the generation, computation, and management of these model metrics by using the Software Metrics Meta-model - SMM.

Full Text:

PDF

DOI: http://dx.doi.org/10.14279/tuj.eceasst.24.339
DOI (PDF): http://dx.doi.org/10.14279/tuj.eceasst.24.339.356

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Provide a metamodeling environment and a domain- specific modeling environment. GReAT: A graph transformation tool from ISIS, Vanderbilt University. Build on GME for metamodel to metamodel transformation and support UMT. (Yuri Gurevich) AsmL: An ASM-based formal specification language developed by Microsoft Research. Provide a set of tools to do simulation, model check and validation.

Develop a set of simple modeling languages for the semantic units and specify their semantics in a formal semantics framework. DSML Design Through Semantic Anchoring Step 1: Specify the DSML by using MOF-based metamodels. Step 2: Select appropriate semantic units L = for the behavioral aspects of the DSML. Domain Specific Languages (DSLs) are often defined in terms of metamodels capturing the abstract syntax of the language. For a complete definition of a DSL, both syntactic and semantic aspects of the language have to be specified. Metamodeling environments support syntactic definition issues, but they do not provide any help in defining the semantics of metamodels, which is usually given in natural language. It is based on a translational technique that hooks to the language metamodel its precise and executable semantics expressed in terms of the Abstract State Machine formal method. The chapter also shows how different techniques can be used for formal analysis of models (i.e., instance of the language metamodel). Domain-Specific Language (DSL) is a particular computer programming language used to address a particular problem domain, representation technique, and solution technique. Formal and Practical Aspects of Domain-Specific Languages: Recent Developments is a collection of academic works containing current research on all aspects of domain-specific language. This book is a comprehensive overview in the computer language field and aims to be essential for scholars and practitioners in the software engineering fields by providing new results and answers to open problems in DSL research. Topics Cover