The 3rd International Workshop on Non-functional System Properties in Domain Specific Modeling Languages (NFPinDSML2010)

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Abstract. The NFPinDSML2010 is the 3rd issue in the series of workshops discussing a challenging issue: principles and methods of integrating estimation and evaluation of Non-functional System Properties (NFP), in Model-driven Engineering (MDE) with Domain Specific Modeling Languages (DSML). Particularly, NFPinDSML2010 topic was integration of certification and compliance in MDE.

1 Introduction

In software engineering meeting non-functional system requirements (NFR), such as safety, reliability, timeliness and so on, has been recognized as important as meeting functional. Model Driven Engineering (MDE) is emerging as a major paradigm for engineering software systems, and generally, advocates use of models and transformations in all phases of software engineering process.

In MDE, models are typically specified in Domain Specific Modeling Languages (DSMLs), languages dedicated to engineering systems of particular domain. In order to provide support for evaluating meeting of non-functional system properties, DSMLs need to be complemented by formal languages for estimation and evaluation languages. Similarly to DSMLs, for particular NFPs exist standardized languages. Due to large variety of DSMLs and NFPs that need to be estimated and evaluated, and used formalisms, there is an need for exploring principles of their synergies. NFPinDSML is a workshop that discusses such topic. Particularly, NFPinDSML2010 has explored integration of certification and compliance in MDE.

2 The Workshop Program

NFPinDSML2010 has consisted of two invited talks, one paper presentation session, and one interactive panel session with panelists from the domains of certification and compliance.
2.1 The Morning Workshop Part

The morning workshop part consisted of two sessions. The first session was an invited talk by Prof. Richard Paige from the University of York, United Kingdom. In his talk, he has introduced a model-driven perspective that goes beyond software engineering and provides support for organizational problem solving. Particularly, for complex and very-long term strategic decisions of large organizations. His initial results show that MDE techniques appear as very useful in supporting strategic decision making. However, there is still a need for thorough exploration.

The paper presentation session consisted of three presentations. Mauro Luigi Drago from the Politecnico di Milano, Italy, has presented QVTR² language. QVTR² is an extended QVT-Relations language, and facilitates keeping information about the design rationale in declarative transformations. For keeping the design rationale, QVTR² borrows variability modeling from the domain of Software Product Lines, and keeps alternatives as variation points of the transformation. With such a support, various techniques can be used to evaluate candidate solutions. Particularly, he was demonstrating performance optimization transformation.

Thomas Kuhn from the Fraunhofer Institute of Experimental Software Engineering, Keiserslautern, Germany, was the second presenter. He has introduced an approach for integration of Component Fault Tree analysis into the UML. Fault Tree Analysis is one of the major techniques for safety engineering. Embedding such formalism in standard languages for software development helps in automating software analysis and can significantly reduce the cost and effort for performing one. Thomas and his colleagues have extended the UML component diagrams with concepts for Component Fault Three modeling in the form of UML Profile.

The final presenter was Dominik Sojer from the Technical University Munich, Germany. Dominik’s work was, similarly to Thomas’ a safety engineering domain. He introduced an approach for propagation, transformation and refinement of safety requirements. The outcome of his work is a set of algorithms that support previously mentioned operations on safety requirements. These algorithms are implemented as FTOS tool for model driven development of fault-tolerant embedded systems.

The presentation session was ended with a mini panel. In the mini panel, the presenters were asked to discuss about potential of synergies of their work. All participants have seen a big potential in combining approaches for various analysis purposes. However, a deeper and more thorough discussion is still needed.

2.2 The Afternoon Workshop Part

The afternoon workshop part consisted of a second invited talk and a highly interactive panel with three experienced researchers from the domains of certification and compliance.