Framework to Model Collaboratively

Eugene Syriani

DIRO, University of Montreal, Canada

Extended Abstract

The development of complex software-intensive systems requires stakeholders from diverse domains to work in a coordinated manner on different aspects of the system. Model-driven engineering (MDE) helps in reducing the gap between heterogeneous domains using principles of separation of concerns, automatic generation and domain-specific languages (DSL). Therefore MDE is a potential solution to help develop systems collaboratively. In MDE, stakeholders work on models in order to design, transform, simulate, and analyze systems. Therefore, there is a need for collaborative platforms to allow modelers to work together.

Teams of stakeholders with varying expertise work together to produce a coherent and complete system. This talk first present a set of necessary requirements that must be addressed in a framework that enables collaborative modeling. When collaborating, individuals may work on the same artifact, different parts of the same artifact or distinct artifacts that are part of the whole system. We propose to decompose models into views in order to reduce the amount of conflicts that may occur with concurrent manipulation of artifacts. Also, views provide a finer granularity of control over models to protect them. Furthermore, views, being projections of a model, can customize how models are perceived by the user, either through abstraction or with custom representation of the model. Therefore, multi-view modeling is essential to let users work on different aspects of the system concurrently.

Having users from different domains and expertise, the framework should be able to adapt its environment specifically to the needs and habits of the user. The framework should fundamentally support different paradigms expressed as DSLs, which brings the issue of integrating different languages. Therefore, support for multi-paradigm modeling is essential to reduce the accidental complexity for users and adapt the tool they use to their needs and habits.

To deal with behavioral and dynamic models, it is important to provide support to execute heterogeneous models. In MDE, model transformation is responsible for defining mappings between languages and therefore provding interfaces between two hetergeneous models. It can also define the execution semantics of dynamic languages. Nevertheless, support for simulation and even co-simulation is needed.

In the second part of this talk, I present how the cloud-based multi-user tool AToMPM addresses some of the challenges for building a collaborative platform for modeling. We review what implementation decisions were needed to satisfy the above-mentioned requirements.