SDDI'2007

Identificação

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Título: Validation of Reactive Software from Scenario-Based Models

Resumo:

Requirements validation is an important task in the engineering of software systems, namely when developing a reactive system which typically have an intensive behaviour and lots of interactions with its environment.

The Unified Modelling Language (UML) is a standard multiple-view modelling language. Use cases are one of the UML's diagrams that permit due their simplicity, the dialog between clients and designers. Sequence diagram (SD) are another type of diagram in UML, used to capture some scenarios of system's usage. In this work we consider that use cases gathered from requirements elicitation are described by a set of SDs.

Petri nets constitute a graphical oriented language appropriate to describe the behaviour of systems with characteristics like: concurrency, resource sharing, and synchronization. Coloured Petri Nets (CPNs) is one dialect of high-level Petri nets which make modelling of large systems tractable. The *CPN tools* is a proven and established tool supporting the CPN modelling language.

The main goal of this work is to introduce novel methods into the software development process to create an animation of the problem domain from the set of scenarios descriptions present in the user requirements. This animation can be shown to the users or the clients in order to reproduce the expected scenarios and thus validate them. Thus, non-technical stakeholders are able to discuss and validate the captured requirements. The usage of animation is an important topic in this context, since it permits the user to discuss the system behaviour using problem domain language and concepts. To achieve this goal, we propose to obtain CPN models from scenarios of system usage described in SDs, and to build graphical animations on top of the obtained CPN models. The *CPN tools* support the execution of animation in accordance with the CPN model. Consequently, we need to formalize the involved meta-models, and define transformation rules in order to automate the process of obtaining CPN models. Thus, in an early phase of the development process a graphical animation is used to convince the client that the symbolic model has some meaning in the problem domain, given a possibility to have an increasing correctness, and also completeness, of the validation task.

We have already proposed some rules to translate a given set of SDs into a CPN model representing the global behaviour of the system under consideration. Currently, we are studying how to formalize the involved meta-models in order to define the process of obtaining CPN models and provide tool support for our method. We are also planning to apply this method in the development of an industrial project.