

Project Planning Support by Model Checking

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Today's trend in software and system engineering is to utilize more specialized models. This model-based development approach makes a single engineering task more easy, as the engineer working with one model can focus on the particular aspect of the system. Though collaborations get more difficult, because more models have to be kept consistent. Unfortunately, the process support for model-driven development is still rather weak in today's development environments: static processes are supported, but this is not adequate for collaborations of development teams, which aim to model the best solution in a synergetic way.

The objective of our work was to improve the collaboration support for the development of complex products. We studied self-optimizing mechatronic systems as an example complex products¹. We identified in the area of process support some use cases which are not supported by today's development environments in an adequate manner. Parallel, iterative, and incremental processes models require that both, developers and project managers are able to identify the impact of a change of a model while other developers are working on the system.

In our approach, the impact should not be named only in terms of depended documents, but instead in terms of tasks. For that, the dependency analysis algorithm has to consider also the current state of the project and the process model. So, developers can get in negotiation quickly and project managers have a basis for an update of the project plan.

We present a technique for project planning which utilizes relations between models and which uses a verification method to produce suggestion for the project plan, based on the current situation of the project. For our implementation we applied the real-time model checker UPPAAL to perform a reachability analysis in the the state space. The performance was sufficient to let it be run in the workspace of developers and project managers interactively.

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