

Examining the Potential of Variability Management in Model-Based Software Development

Motivation

| Model-based software and system development is widely spread within the automotive industry. Many enterprises offer a large number of product variants and versions. This large variety results in a great number of models and a more complex management of these models. A solution to this problem are specific concepts that are used in software product line development guaranteeing systematic reuse and management of artefacts and documents of the software development process.



Task

For modeling software product lines within levels of the software process, common modeling concepts are usually upgraded with new elements. Let's take a Simulink model as an example: we can model different possible behavior (corresponds to variants) via if-statements here.

The focus of this diploma thesis lies in examining existing concepts and approaches of modeling variability in Simulink using a real driver-assistant system on our automotive model car. The core task is the analysis of weak spots of existing approaches. Based on this analysis, you're supposed to either improve the approaches or develop a completely new approach. It is of importance to not only take into regard single aspects of the product line development process but to regard the process as a whole.

Tasks

- Detailed literature research on the topic of variability in Simulink (modeling concepts, tools etc.)
- Enhancing automatic parking with the named concepts on our automotive model car
- Evaluation in regard to possible weak spots during product line development in Simulink

Goal

In the scope of an industrial project with a well-known automotive manufacturer, your task is to provide an overview of current approaches of product line modeling in Matlab/Simulink and to point out new innovative trends within the research area.

Fields of Study

- Computer science, electrical engineering or comparable

Tutor

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Last update: **2009/06/13 11:15**

