Model-based Development of Software Product Lines

Master Project Proposal

Motivation and Context

A *software product line* is a set of systems with well-defined commonalities and variabilities that are developed by managed reuse. Usually, the products of a software product line are described by a feature model where a feature denotes a particular characteristic of a product. During development of a product line, the features have to be associated with design and implementation artifacts. Δ-Modelling [1] is an approach for incremental model-based development of software product lines by stepwise model refinement.

Project Goals

The goal of this master thesis project is a case study for the model-based development of software product lines using Δ-Modelling. The case study comprises the following tasks:

- Design of the example software product line by stepwise model refinement based on UML modelling concepts, e.g., component diagrams, class diagrams, state charts, ...
- Implementation the product line using Frame Technology to facilitate automated derivation of product implementations
- Development of design guidelines for the Δ-modelling approach from the experiences of the case study, Development of tool support for Δ-Modelling (e.g. as Eclipse plugin).

Prerequistes

Knowledge in Model-based Development ("TDA593 - Model driven software development") and Product Line Engineering ("DAT165 Software product line engineering"). Programming Experience in Java. Knowledge of the Eclipse Platform is an advantage.

Contact

Ina Schaefer
`http://www.cse.chalmers.se/~schaefer/`
Software Engineering using Formal Methods Group
`http://www.chalmers.se/cse/EN/research/research-groups/formal-methods/`
Phone: +46 - 31 - 772 - 1072
Email: schaefer@chalmers.se

Literature

[1] I. Schaefer, A. Worret, and A. Poetzsch-Heffter. A model-based framework for automated product derivation. In *Workshop on Model-based Approaches in Product Line Engineering (MAPLE)*, 2009.