A Change Management Approach in Product Lines for Use Case-Driven Development and Testing

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Context & Problem Statement

1) Context
   - Automotive domain: software development driven by standards
   - Use case centric development and requirements-driven testing
   - Evolution of requirements and test cases in a family of products

2) Problem Statement
   - Ad-hoc change management in the context of product lines

Project Goals

- A modeling method for capturing variability information in product line use case and domain models
- An automated configuration approach for product specific use case and domain models
- A change impact analysis approach for product line use case and domain models
- An automated regression test selection approach for product line use case and domain models

Product line Use case modeling Method: PUM

- Modeling variability in product line use case and domain models
- Relying on Natural Language Processing (NLP) to automatically report inconsistencies between product line use case diagrams and specifications

Requirement Configuration Approach: PUMConf

- PUMConf guides stakeholders in making configuration decisions in product line models and automatically generates product-specific use case and domain models

Current & Future Activities

- Change impact analysis for evolving configuration decisions
- Change impact analysis for evolving product line use case and domain models
- Automated regression test selection for test cases derived from use case models

Selected Publications