

Master's Thesis

**Distributed and Feature-oriented Version Control within the  
FORCE Feature-oriented Development Environment**

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FORCE is a feature-oriented development environment supporting software development, maintenance and evolution in industrial software ecosystems. Its key concepts are a multi-level, multi-purpose feature modeling approach, feature-to-code mappings which allow maintaining features traces to code, a model repository for persisting and managing versions and variants of feature implementations, and multi-language static analysis methods. The feature model in FORCE is based on FeatureIDE [1] and has already been extended in [2] in order to support models for different purposes and at multiple levels and allows a decomposition of models into components.

In this Master's thesis FORCE should be further extended to cope with the challenges of development and evolution industrial software ecosystems as follows:

- ECCO [3] is a feature-oriented source code repository which allows maintaining and management variants and versions of feature implementations and automatically establishing and maintaining feature-to-code mappings. ECCO will serve as the underlying code repository of FORCE. It is the task of this master's thesis to integrate ECCO as a code repository in FORCE. This work includes the implementation of readers to parse respective source code elements, create feature-to-code mappings and store those as ECCO artifacts in the ECCO repository. Likewise, writers should compose artifacts from feature selections and create respective source code files.
- In industrial SECO development and evolution, version management is particularly challenging. Versions exist of various artifacts, like features, components, products, and repositories. An important task of this thesis will therefore be the support of management of version of various artifacts within FORCE. Version management will again be based on ECCO's version management capabilities.

Referenzen

[1] Thüm, T., Kästner, C., Benduhn, F., Meinicke, J., Saake, G., Leich, T.: FeatureIDE: An extensible framework for feature-oriented software development. *Sci. Comput. Program.* 79, 70–85 (2014)

[2] Rabiser, D.; Prähofer, H.; Grünbacher, P.; Petruzella, M.; Eder, K.; Angerer, F.; Kromoser, M.; Grimmer, A.: Multi-Purpose, Multi-Level Feature Modeling of Large-Scale Industrial Software Systems. *Software and Systems Modeling*, accepted for publication.

[3] Recovering Feature-to-Code Mappings in Mixed-Variability Software Systems (Lukas Linsbauer, Florian Angerer, Paul Grünbacher, Daniela Lettner, Herbert Prähofer, Roberto Lopez-Herrejon and Alexander Egyed), 2014.