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Master's Thesis

A Persistence Layer for the ECCO Variation Control System based on JPA and JDO

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Master-Thesis:

FORCE (Feature-ORiented Component Engineering) is a development platform based on Eclipse intended to support software development and evolution in Industrial Software Ecosystems (ISECOs). It is currently under development in the CD Laboratory MEVSS in a cooperation with Keba AG. FORCE can be seen as a feature-based clone-and-own approach for managing multiple distributed product lines in SECOs.

FORCE is based on the following main elements:

1. *A feature-oriented modeling approach* which supports feature models, the hierarchical decomposition and modularization of features models, different kinds of relations and dependencies, as well as versioning of features and feature models.
2. *Configuration-aware static analysis* is based on code models that comprise an abstract syntax tree representation of the program code as well as a configuration-aware system dependency graph (CSDG) which represent all the control and data dependencies globally in a system.
3. *Feature-to-code mappings* connect feature model elements to source code elements and define how optional and alternative features are implemented.

A main part of FORCE is the variation control system ECCO, which is used to maintain the code repository together with code elements mapped to features. Currently, ECCO uses the Java serialization mechanism for persisting the repository. It is the task of this master thesis project to base the persistence layer for ECCO on more powerful Java technologies, which are

- JPA – Java Persistence API
- JDO – Java Data Objects

Specifically, this project will include the following steps:

- Comparison of the two technologies JPA und JDO regarding technical support, technical maturity and supported features
- Evaluation and comparison of different storage backends that support JPA und JDO, which should include:
  - Neo4j
  - MongoDB
  - EclipseLink
  - Data Nucleus

    - ObjectDB
- Implementation of a persistence layer for ECCO on chosen technologies that supports transactions, lazy loading, etc.
- Evaluation and comparison of the different implementations