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Mapping Feature Models to Code Using a Reference Architecture: A Case Study

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Abstract : Mapping the artifacts coming from a set of similar products family developed in an ad-hoc manner to make up the resulting software product line (SPL) plays a key role to maintain the consistency between requirements and code. This paper presents a feature mapping approach that focuses on tracing the artifact coming from the migration process, the current feature model (FM), to the other artifacts of the resulting SPL, the reference architecture, and code. Thus, our approach relates each feature of the current FM to its locations in the implementation code, using the reference architecture as an intermediate artifact (as a centric point) to preserve consistency among them during an SPL evolution. The approach uses a particular artifact (i.e., traceability tree) as a solution for managing the mapping process. Tool support is provided using friendlyMapper. We have evaluated the feature mapping approach and tool support by putting the approach into practice (i.e., conducting a case study) of the automotive domain for Classical Sensor Variants Family at Bosch Car Multimedia S.A. The evaluation reveals that the mapping approach presented by this paper fits the automotive domain.

Keywords : feature location, feature models, mapping, software product lines, traceability
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