Tarski: A Platform for Automated Analysis of Dynamically Configurable Traceability Semantics

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Abstract

Traceability can be defined as the degree to which a relationship can be established among work products of the development process. Traceability is important to support the consistency and likewise to ensure that a system is understandable, maintainable and reliable. Several approaches have been proposed to model traceability elements and reason about them by extending a predetermined set of possible trace links with fixed semantics. Furthermore, they do not cope with the need for dynamic adaptation and configuration of traceability semantics. However, different project types usually require various ways of tracing the system to obtain richer and precise automated traceability analysis. In this paper, we introduce a novel approach with its supporting platform which enables the user to rigorously configure the system based on project-specific needs and interactively specify the semantics of traceability elements. The semantics of traceability elements are formalized using first-order relational logic, which are used to facilitate different form of automated analysis. The use of the approach and the corresponding tool is described within the context of an industrial application life-cycle management process.