Diploma Thesis

Specifying Life Cycle Requirements for mobile Applications

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Topic
In mobile software development understanding the life cycle model plays an important role for high quality applications. The Embedded Software Laboratory has developed a tool for testing life cycle-related properties, called *AndroLIFT*, and another tool, called *Higgs*, for cross-device test case execution, both for mobile applications. Higgs can be used in combination with AndroLIFT to execute life cycle-related cross-device test cases. Test cases for Higgs and AndroLIFT are written separately for each tool in pure source code. In order to ease the specification of life cycle test cases, which are currently split over these two tools, and to increase their readability as well as understandability, this work focuses on the analysis of existing specification languages and their adaption to the area of life cycle-related requirements. Two of the specification languages to analyze are *Frank* and *Past Time Linear Temporal Logic (ptLTL)*, where Frank is a natural wording specification language used for iOS development and ptLTL is a specification language used in the area of formal verification.

Goal
The goal of this diploma thesis is to analyze existing specification languages, especially Frank and ptLTL, and, based on the results, to design a specification language for life cycle-related requirements of mobile applications. The focus is on Android and iOS.

Approach
At first we look into Frank and ptLTL in order to analyze their capabilities for specifying life cycle-related properties. Regarding the results of the analysis, we design a specification language based on Frank for manual, natural wording test case specification. A parser transforms the test scripts into Java code, executable by Higgs and AndroLIFT. The second part of the thesis deals with temporal-related requirements, which cannot be handled by a Frank-based language. They shall be covered by ptLTL. The possibilities of automatic life cycle test case generation from corresponding ptLTL formulae shall be evaluated.

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