Model-based Testing for Reactive Systems. Intelligent Approaches

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Testing is a crucial step in the software development life-cycle. It is common to dedicate at least 50% of the project resources to this step. Model-based testing is a testing approach that can facilitate the automatic test-case generation and thus testing costs can be significantly reduced.

The goal of this thesis is to address some of the fundamental problems of automatic test-case generation in safety critical, reactive systems. The research involved also focuses on the development and analysis of intelligent methods for the optimization of the automatic test-case generation process. Some of the main areas of interest are: statistical testing, evolutionary testing and estimation of distribution algorithms used in test-automation.

The practical part of the thesis aims to test the proposed methods and algorithms on problems within the domain of railway automation.