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LEHRSTUHL FÜR INFORMATIK 2

RWTH Aachen · D-52056 Aachen · GERMANY

Bachelorarbeit

Testing with Timed Automata

Short Summary

The goal is to develop a testing tool which can be used for timed testing of reactive systems, such as protocol units, web-server, or embedded control software. The tool is to be tried by performing some lab-environment tests.

Context

Specification-based testing is a formal approach to test reactive systems. The behaviour of the implementation under test (IUT) is compared with the behaviour of a *formal model*, which specifies unambiguously the correct behaviour. A testing tool is sending inputs to the IUT, observes its outputs, and casts its verdict on the observed outputs (pass/fail). Whereas tools for *functional* specification-based testing are around for a decade or so, *timed* specification-based testing is relatively new. The real-time aspects in timed testing is that not only is important *what* outputs are observerved, but also *when*. Approaches exist which use *timed automata* as specification formalism.

The Assignment

The task is to design and implement a testing tool for timed testing using timed automata. Whereas many components and an abstract algorithm do already exist, a clever design of the whole system has to be developed: timed testing depends on the efficiency of the testing tool, to minimise the risk of influencing the outcome. The task is thus to design the system, implement it, and try it out on some small examples.

Requirements

Useful would be some basic knowledge and interest in formal methods (Do you like the lectures "Modelling Concurrent Systems" or "Model Checking"?). Some experience in C or C++ is required.

Contact

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Wir sprechen Deutsch :-).