Tests for mixed discrete-continuous systems

Model-based testing relies on the use of behavior models to automatically generate sequences of inputs and expected outputs. These sequences can be used as test cases to the end of both validating the model and also verifying an actual system. In the automotive domain many systems are reactive and exhibit continuous as well as discrete dynamics. This leads to an explosion of the model state space, which makes automated test case generation difficult, and, because of imprecisions in the continuous parts, requires an adequate treatment of fuzziness both in the dimensions of time and values. We report on experiments with model-based testing in the automotive domain. Roughly, the idea is to use two separate models, a discrete model as an abstract description of relevant scenarios, and a discrete-continuous model to produce reference outputs for the actual system.

Stichworte: model-based testing; test case generation; discrete abstractions; nondeterminism

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