Reading report MDE

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Abstract

I was interested in MDE projects involving software verification thus my reading part consists of two papers focused on that theme.

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1. A Survey of Automated Techniques for Formal Software Verification [1]

Description. This is a general paper about software verification. It surveys algorithms that perform automatic static analysis of software to detect programming errors or prove their absence. The three techniques considered are **static analysis with abstract domains**, **model checking**, and **bounded model checking**. A short tutorial on these techniques is provided, highlighting their differences when applied to practical problems. This paper also surveys tools implementing these techniques and describes their merits and shortcomings.

2. Approximating Continuous Systems by Timed Automata [2]

Description. This paper shows a technique for over-approximating continuous dynamical systems by timed automata. The technique refines commonly-used discrete abstractions which are often too coarse to be useful. The essence of it is the partition of the state space into cubes and the allocation of a clock for each dimension. This delivers much better approximations of the behavior.

References

[1] G. W. Vijay DSilva, Daniel Kroening, A survey of automated techniques for formal software verification`doi:10.1109/TCAD.2008.923410`.

[2] G. B. Oded Maler, Approximating continuous systems by timed automata`doi:10.1007/978-3-540-68413-8_6`.

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