

Modelling using timed automata

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Timed automata (TA) are a *finite state machine (FSM)* extended with real-value clocks [2] and variables comparable to integers. The *FSM* transitions may be guarded by expressions involving the clocks and the variables. This enables or disables specific transitions.

The *TAs* allow us to model and analyse timing of computer systems. Other formalisms with the same purpose exist. This includes timed petri nets, timed process algebras and more [1].

Several tools for *TA* system modelling exist including Kronos and Uppaal [3]. The Uppaal is an integrated tool environment for modeling, simulation and verification of *TA* systems. The models consist of a collection of non-deterministic processes with finite control structure and real-valued clocks. The processes communicate via channels and shared variables.

First, I will present *TA* formalism. Next, I will show and explain simple *TA* model of a system. The model will be then modelled using the Uppaal tool.

References

- [1] Timed Automata: Semantics, Algorithms and Tools. [cit. 10-10-2015].
URL <http://www.seas.upenn.edu/~lee/09cis480/papers/by-lncs04.pdf>
- [2] Timed automaton - Wikipedia, the free encyclopedia. [cit. 09-10-2015].
URL https://en.wikipedia.org/wiki/Timed_automaton
- [3] UPPAAL. [cit. 09-10-2015].
URL <http://www.uppaal.org/>