

**D'Souza, Deepak; Tabareau, Nicolas**

**On timed automata with input-determined guards.** (English) Zbl 1109.68503

Lakhnech, Yassine (ed.) et al., Formal techniques, modelling and analysis of timed and fault-tolerant systems. Joint international conferences on formal modelling and analysis of timed systems, FORMATS 2004, and formal techniques in real-time and fault-tolerant systems, FTRTFT 2004, Grenoble, France, September 22–24, 2004. Proceedings. Berlin: Springer (ISBN 3-540-23167-6/pbk). Lecture Notes in Computer Science 3253, 68–83 (2004).

Summary: We consider a general notion of timed automata with input-determined guards and show that they admit a robust logical framework along the lines of [*D. D'Souza*, “A logical characterisation of event clock automata”, *Int. J. Found. Comput. Sci.* 14, No. 4, 625–639 (2003; [Zbl 1101.68647](#))], in terms of a monadic second-order logic characterisation and an expressively complete timed temporal logic. We then generalize these automata using the notion of recursive operators introduced by Henzinger, Raskin, and Schobbens [*T. A. Henzinger, J.-F. Raskin and P.-Y. Schobbens*, “The regular real-time languages”, *Lect. Notes Comput. Sci.* 1443, 580–591 (1998)], and show that they admit a similar logical framework. These results hold in the “pointwise” semantics. We finally use this framework to show that the real-time logic MITL of Alur et al [*R. Alur, T. Feder and T. A. Henzinger*, “The benefits of relaxing punctuality”, *J. ACM* 43, No. 1, 116–146 (1996; [Zbl 0882.68021](#))] is expressively complete with respect to an MSO corresponding to an appropriate set of input-determined operators.

For the entire collection see [[Zbl 1061.68004](#)].

**MSC:**

[68Q45](#) Formal languages and automata

[03D05](#) Automata and formal grammars in connection with logical questions

Cited in **6** Documents

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