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THE LOGIC OF EVENT CLOCKS
Decidability, Complexity and Expressiveness [1] [2] [3]

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ABSTRACT

In this paper we define the real-time *logic of event clocks*. This logic is inspired from *event clock automata*. The logic is defined, illustrated and shown to be decidable in PSPACE by a simple decision procedure that relies to a reduction to event clock automata. The expressive power of the logic is compared to known formalisms.

Keywords: Logics of Programs, Temporal Logic, Real Time, Decidability, Complexity, Expressiveness.

1. Introduction

It is now widely recognized that the use of formal methods is useful and often necessary for developing correct concurrent and reactive systems. This observation is even clearer when dealing with real-time [6] and hybrid systems [15]. Among the favorite formalisms to specify and verify concurrent systems are temporal logics. Temporal logics [12, 19] are modal logics that enable the expression of properties about the ordering of events in executions of concurrent programs [21]. For example, the linear temporal logic (LTL) formula $\Box(p \rightarrow \Diamond q)$ expresses the property that every p-event is always followed by some q-event. In that context, reactive systems are usually

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