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Model Checking Real-Time Systems with Schedulers

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The purpose of this research is to propose an approach to model checking the real-time systems by taking schedulers into account. Recent years, model-checking for real-time systems is well developed based on the state-region graph technique of Alur, Courcoubetis and Dill. There are so many research and tool for supporting model checking the correctness of real-time systems. These research are mainly focus on some specific scheduling policies with general task behavior like in TIMES tool. However, these works are faced with two difficulties: checking a system design with various scheduling policies and model the correct functional view of the real-time task.

In this thesis we report on work deal with above problems by introducing abstraction scheduler model and a system framework for realizing the functional view of real-time task. This abstraction makes it possible to check RTS with multiple schedulers at once and analyze broad properties related to the schedulers. The tool we used to realize our approach is UP-PAAL. As the result we have done some experiment of our approach on some real-time systems.