

EINLADUNG

Zeit: Montag, 25 Januar 2016, 16:00 Uhr
Ort: AHI, Ahornstraße 55
Referent: Prof. Dr. Goran Frehse
Universität Joseph Fourier Grenoble1- Verimag
Titel: Semi-Template Reachability and Timed Separation in Hybrid Systems

Abstract:

Hybrid automata combine finite state models with continuous variables that are governed by differential equations. They are difficult to analyze since neighboring states, no matter how close, may exhibit qualitatively different behaviors. Set-based reachability constructs a cover of all behaviors by exhaustively computing one-step successor states until a fixed-point is found. If precise enough, it can show safety of the system as well as provide quantitative bounds on key variables. On the downside, it can only be computed approximately and is difficult to scale to complex systems. The approximation error requires particular attention since it can accumulate rapidly, leading to a coarse cover, prohibitive state explosion, or preventing termination. We present an approach with precise control over the balance between approximation error and scalability. By lazy evaluation of abstract set representations, the precision can be increased in a targeted manner, e.g., to show that a particular transition is spurious. Each evaluation step scales well in the number of continuous variables. The set representations are particularly suited for clustering and containment checking, which are essential for reducing the state explosion. The approach is illustrated on several examples.

Es laden ein: Die Dozenten der Informatik