

Reachability computation for safety analysis of hybrid systems: an approach based on linear inclusion abstraction

Hervé Gueguen, 07/02/2008.

The talk discusses reachability computations for safety analysis of continuous time hybrid systems. First we present the characteristics of hybrid systems and various approaches used to formally guarantee safety and solve reachability. Then we present our approach for systems with affine continuous dynamics. Spectral properties of the matrix of the dynamics are used in order to specify a partition of the continuous state space. From this partition it is possible to build a linear inclusion abstraction in order to compute an over-approximation of the reachable space. The specific vectors that are used to define the partition allow getting simple differential inclusions and polyhedral approximations of the reachable space. In the last part of the talk we will show how this procedure can be extended to uncertain systems.