

Bounded model checking of hybrid systems

Martin Fränzle
University of Oldenburg, Germany

The analysis of hybrid discrete-continuous systems calls for explicitly modeling and evaluating the tight interaction of their discrete switching behavior and their continuous dynamics. Within this lecture, we concentrate on automatic analysis of hybrid systems through bounded model checking, explaining symbolic methods manipulating both the discrete and the continuous state components symbolically by means of predicative encodings fed to dedicated constraint solvers. We provide a brief introduction to hybrid discrete-continuous systems and continue to a set of constraint-based methods for automatically analyzing different classes of hybrid discrete-continuous dynamics, covering the range from non-linear discrete-time hybrid systems to probabilistic hybrid systems.