

# Dynamics and Verification

Where is the Link ?

## Verification has Changed

- From computation oriented programs to reactive systems.
- From discrete to hybrid systems.
- From proofs to state-space exploration.
- From logic to algorithms and data structures.

## Today's Program in this Perspective

- *Laurent Fribourg*: Data structures for representing sets of states (OBDDs and Difference Bounded Matrices).
- *Bernard Boigelot*: Data structures and algorithms for representing and exploring infinite state spaces (NDDs, QDDs, ...).
- *Ahmed Bouajjani*: Data structures for analyzing parametric clock automata.
- *Eugene Asarin*: The impact of noise on the decidability of classes of hybrid systems. Quite far from traditional verification concerns.
- *Kim Larsen*: Efficient data structures and algorithms for symbolic representation and manipulation of the state-space of real-time and hybrid systems.

## Two Questions

**Is all this relevant to dynamical systems?**

Possibly, at least the goals are looking increasingly similar.

**Is the study of dynamical systems relevant to verification ?**

- Verification often still does not produce results.
- Improving data structures and algorithms can help.
- But, the most crucial step is building models that are sufficiently simple to be analyzed and yet meaningful. For this, there is probably a lot to learn from methods used in the study of dynamical systems.