Logic and Hybrid Systems

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- ▶ Dynamical Systems exhibiting both discrete (jump) and continuous (flow) behaviors.
- ▶ Serve as models of physical systems, from thermostats to trains.
- ▶ Continuous dynamics specified using Differential Equations.

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- ▶ Introduces Hybrid Program - program notation for hybrid systems.
- ▶ Dynamic Logic for Hybrid Programs, a generalization of Dynamic Logic.
- ▶ Suited for automation.

Hybrid Automata

- Commonly used to model Hybrid Systems, via Graphs.
- Nodes specify continuous dynamics. Edges describe discrete transitions.
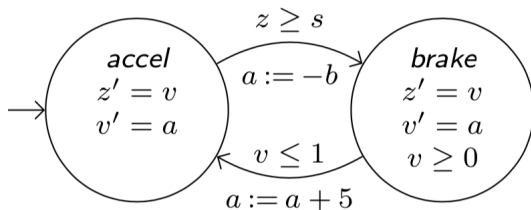- Intuitive, but not suitable for deductive verification.

Figure: Hybrid Automata (simplified) of a Train Control System