

MN 700 A1: Hybrid systems: theory, computation, and applications (Fall 2007)

Instructor:

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Time and location: Tue Thu 4:00 – 6:00, GCB 206

Description: Hybrid systems are dynamical systems with mixed continuous dynamics (modeled by differential equations) and discrete dynamics (usually modeled by automata). Examples can be found in both natural and manmade environments, ranging from intercellular and intracellular networks in biology to networked embedded systems in avionics and automotive controls. In this class, I will present recent results in modeling, simulation, analysis, and control of such systems. The focus of the class will be on computation, and it will contain several examples from biological and robotic networks.

Audience: graduate students with interest in dynamics, controls, computation and application areas such as biochemical networks, and/or robot networks.

Prerequisites: There are no specific prerequisites for this course. The necessary background will be provided in the class. However, a certain level of mathematical maturity is necessary, such as familiarity with linear algebra and differential equations. Background in control theory and/or automata theory is helpful, but not required.

Grading: The grade will be based on homework and final project.

Textbook: None required. Reading material will be provided in the class.