RAFAL GOEBEL, Loyola University Chicago, 1032 W. Sheridan Road, Chicago, IL 60660
Homogeneous approximations of hybrid dynamical systems

Hybrid dynamical systems are systems that combine features of continuous-time dynamical systems and discrete-time dynamical systems, and can be modeled by a combination of differential equations or inclusions, difference equations or inclusions, and constraints.

The talk presents techniques for approximating hybrid dynamical systems that generalize classical linearization techniques. The approximation techniques involve linearizations, tangent cones, homogeneous approximations of functions and set-valued mappings, and tangent homogeneous cones, where homogeneity is considered with respect to general dilations. Main results deduce asymptotic stability of an equilibrium for a hybrid dynamical system from pre-asymptotic stability of the equilibrium for an approximate system.

The results come from joint work with Andy Teel.