

Author:

Pierdomenico Pepe (University of L'Aquila, Italy)

Title:

Practical stabilization of nonlinear retarded systems: continuous-time and sampled-data controllers

Abstract:

In this talk Sontag's universal practical stabilizer is presented for nonlinear systems described by Retarded Functional Differential Equations. Sufficient conditions for practical stabilization and input-to-state practical stabilization are shown, in terms of invariantly differentiable control Lyapunov-Krasovskii functionals. Results concerning sampled-data controllers are also presented. It is shown that suitable steepest descent state feedbacks (continuous or not) induced by control Lyapunov-Krasovskii functionals, yield practical stabilization with arbitrary small final target ball of the origin, when applied to the system by sampling and holding with sufficiently fast sampling. It is shown that the first order spline approximation method can be successfully used in order to implement (infinite dimensional) state feedbacks by a finite number of (finite dimensional) samples of the system variable. Examples of application are shown.