ABSTRACT: The notion of input-to-state stability, given by Sontag in 1989, has had a great impact in the analysis and control of finite dimensional systems described by ordinary differential equations. In the last ten years, the same notion has been investigated for nonlinear systems described by retarded functional differential equations. In this lecture, a Lyapunov-Krasovskii characterization of the input-to-state stability property for these systems will be shown. The related problem of the attenuation of the unknown actuator disturbance will be addressed and a solution shown by means of invariantly differentiable and Fréchet differentiable Lyapunov-Krasovskii functionals. The application of the theoretical results to a chemical reactor with recycle will be shown.

REFERENCES