ABSTRACT

Santos, George Carneiro dos. *Extremum Seeking with Time-Varying Delays*. 2017. 60f. Dissertation (Master Degree in Electronic Engineering) - Faculty of Engineering, University of the State of Rio de Janeiro (UERJ), Rio de Janeiro, 2015.

This work presents a Gradient-based extremum seeking algorithm to deal with known and arbitrary actuator-sensor delays by using a predictor with a perturbation-based estimate of the Hessian. Local exponential stability and convergence to a small neighborhood of the unknown extremum point are guaranteed. This result is achieved by using backstepping transformation and averaging in infinite dimensions. Numerical simulations are given to illustrate the effectiveness of the proposed predictor based extremum seeking control for time-delay compensation.

Keywords: Time delays; Adaptive systems; Extremum seeking; Predictor; Backstepping transformation; Averaging in infinite dimensions.