

ABSTRACT

MELO, Gabriel Tavares de. *Adaptive Sliding Mode Control for Disturbances with Unknown Bounds*. 101 f. Dissertation (Master's Degree in Electronic Engineering) - Faculty of Engineering, Rio de Janeiro State University (UERJ), Rio de Janeiro, 2017.

In this thesis, a comparative study of different methodologies found in the literature regarding switching gain adaptation in sliding mode control in the presence of disturbances is presented. Simulations of these methodologies are presented, as well as their advantages and disadvantages. A novel adaptive gain methodology based on the extended equivalent control concept, capable of rejecting non-smooth disturbances is presented, including experimental results. A new methodology based on monitoring functions is also presented. Differently from other adaptive algorithms, this strategy requires no information about the state variables, only output-feedback is assumed. Simulations illustrate the performance of the new methodologies presented.

Keywords: Sliding Mode Control; Unknown Disturbances; Adaptive Control; Disturbance Rejection.