



Optimal and Adaptive Anti-Windup Design in the Presence of Uncertainty

By Martin Henrik Bruckner

Trauner Verlag Okt 2011, 2011. Buch. Book Condition: Neu. 238x169x12 mm. Neuware - Robustness and actuator limitations are key issues in control theory and applications. However, the study of robust stability and performance properties for the class of nonlinear systems consisting of a linear system with input magnitude saturation is still far from complete. In fact, while robustness-in-the-small (i.e. for sufficiently small uncertainties) usually comes simply by continuity, robustness-in-the-large (that is, for a priori given, possibly large uncertainty sets) requires a careful design. In this context, this thesis considers the popular Anti-Windup (AW) approach to deal with actuator limits and large uncertainties and proposes two solutions. The first approach is based on the framework of Integral Quadratic Constraints and provides an H₂/H₈-mixed performance synthesis method, which allows to trade-off robustness against performance. The second approach follows the existing idea about a weakened anti-windup compensator, where the AW compensator is allowed to modify the closed loop response even if no saturation has occurred, as long as this is necessary to guarantee robust stability. 168 pp. Englisch.



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