



Constrained Optimal Control: Piecewise Affine and Linear Parameter-Varying Systems (Paperback)

By Thomas J Besselmann

Createspace, United States, 2010. Paperback. Condition: New. Language: English . Brand New Book ***** Print on Demand *****.The scope of this thesis lies in the field of constrained optimal control. More precisely, it is concerned with the constrained finite-time optimal control of two system classes: piecewise affine systems and linear parameter-varying systems. Firstly, constrained finite-time optimal control (CFTOC) of piecewise affine (PWA) systems is revisited. Since the actual computation of hybrid controllers as the explicit solution to parametric CFTOC problems for piecewise affine systems is already rather mature, this part deals with a post-processing algorithm. If the cost function of the CFTOC problem is quadratic, the optimization problem at hand is a parametric mixed-integer quadratic program, which can be solved by decomposing it into a number of quadratic programs. Thereby redundant regions are computed, which increase the storage demand and the online evaluation time of the resulting controller. We propose a post-processing algorithm for the removal of redundant regions. Furthermore, we examine the application of hybrid control methods to two systems: a mechanical system with backlash and autonomous vehicle steering. The second part of this thesis is devoted to constrained optimal control of linear parameter-varying (LPV) systems. A sequence of...



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