1.	Record Nr.	UNINA9910823657203321
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	Titolo	Model predictive control for nonlinear continuous-time systems with and without time-delays / / vorgelegt von Marcus Reble
	Pubbl/distr/stampa	Berlin : , : Logos, , [2013] ©2013
	ISBN	3-8325-9362-4
	Descrizione fisica	1 online resource (162 pages)
	Disciplina	629.8
	Soggetti	Predictive control Time delay systems
	Lingua di pubblicazione	Inglese
	Formato	Materiale a stampa
	Livello bibliografico	Monografia
	Note generali	PublicationDate: 20130410
	Sommario/riassunto	Long description: The objective of this thesis is the development of novel model predictive control (MPC) schemes for nonlinear continuous-time systems with and without time-delays in the states which guarantee asymptotic stability of the closed-loop. The most well-studied MPC approaches with guaranteed stability use a control Lyapunov function as terminal cost. Since the actual calculation of such a function can be difficult, it is desirable to replace this assumption by a less restrictive controllability assumption. For discrete-time systems, the latter assumption has been used in the literature for the stability analysis of so-called unconstrained MPC, i.e., MPC without terminal cost and terminal constraints. The contributions of this thesis are twofold. In the first part, we propose novel MPC schemes with guaranteed stability based on a controllability assumption, whereas we extend different MPC schemes with guaranteed stability to nonlinear time-delay systems in the second part. In the first part of this thesis, we derive explicit stability conditions on the prediction horizon as well as performance guarantees for unconstrained MPC. Starting from this result, we propose novel alternative MPC formulations based on combinations of the controllability assumption with terminal cost and terminal constraints. One of the main contributions is the development

of a unifying MPC framework which allows to consider both MPC schemes with terminal cost and terminal constraints as well as unconstrained MPC as limit cases of our framework. In the second part of this thesis, we show that several MPC schemes with and without terminal constraints can be extended to nonlinear time-delay systems. Due to the infinite-dimensional nature of these systems, the problem is more involved and additional assumptions are required in the controller design. We investigate different MPC schemes with and without terminal constraints and/or terminal cost terms and derive novel stability conditions. Furthermore, we pay particular attention to the calculation of the involved control design parameters.