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**Sommario** Over the last decades, the methodologies of dynamical systems and control theory have been playing an increasingly relevant role in a lot of situations of practical interest. Though, a lot of theoretical problem still remain unsolved. Among all, the ones concerning stability and stabilization are of paramount importance. In order to stabilize a physical (or not) system, it is necessary to acquire and interpret heterogeneous information on its behavior in order to correctly intervene on it. In general, those information are not available through a continuous flow but are provided in a synchronous or asynchronous way. This issue has to be unavoidably taken into account for the design of the control action. In a very natural way, all those heterogeneities define an hybrid system characterized by both continuous and discrete dynamics. This thesis is contextualized in this framework and aimed at proposing new methodologies for the stabilization of sampled-data nonlinear systems with focus toward the stabilization of cascade dynamics. In doing so, we shall propose a small number of tools for constructing sampled-data feedback laws stabilizing the origin of sampled-data nonlinear systems admitting cascade interconnection representations. To this end, we shall investigate on the effect of sampling on the properties of the continuous-time system while

enhancing design procedures requiring no extra assumptions over the sampled-data equivalent model. Finally, we shall show the way sampling positively affects nonlinear retarded dynamics affected by a fixed and known time-delay over the input signal by enforcing on the implicit cascade representation the sampling process induces onto the retarded system.

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Localizzazioni e accesso

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