Some Generalizations of Lyapunov's Approach to Stability and Control

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Abstract: In the paper presents a brief survey of some new developments in Lyapunov's approach including the generalized perturbation equation and its applications; the use of nonanalytic Lyapunov functions; an extension of the Barbashin-Krasovskii theorem related to asymptotic stability assured by a Lyapunov function with nonpositive derivative; the consistency condition for a time-space mosaic that constitutes a discontinuous Lyapunov function valid for investigation of stability; the introduction of non sign-definite functions for use in control (carrying surfaces); the extremal set construction for control, stabilization, and nonlinear asymptotic observer design.

Keywords: *nonanalytic Lyapunov function; nonperiodic systems; control and identification; discontinuous Lyapunov function.*

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