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Record Nr. UNISA996464394603316 Autore Zhang Yunong <1973-> Titolo Zhang-gradient control / / Yunong Zhang, Binbin Qiu, Xiaodong Li Pubbl/distr/stampa Singapore:,: Springer,, [2021] ©2021 **ISBN** 981-15-8257-2 Edizione [1st ed. 2021.] 1 online resource (XLI, 282 p. 109 illus., 86 illus. in color.) Descrizione fisica Disciplina 629.8 Soggetti Automatic control Nonlinear systems Lingua di pubblicazione Inglese **Formato** Materiale a stampa Livello bibliografico Monografia Nota di bibliografia Includes bibliographical references and index. Nota di contenuto Introduction, Concepts and Preliminaries -- ZG Tracking Control of a Class of Chaotic Systems -- ZG Synchronization of Lu and Chen Chaotic Systems -- ZG Tracking Control of Modified Lorenz Nonlinear System -- ZG Tracking Control of Brockett Integrator -- ZG Tracking Control and Simulation of DI System -- ZG Tracking Control of MI Systems --ZD and ZG Control of Simple Pendulum System -- Cart Path Tracking Control of IPC System -- Pendulum Tracking Control of IPC System --GD-Aided IOL Tracking Control of AFN System -- ZG Trajectory Generation of Van der Pol Oscillator -- ZD, ZG and IOL Controllers for AFN System -- PDBZ and TDBZ Problems Solving and Comparing -- ZG Output Tracking of TVL System with DBZ Handled -- ZG Stabilization of TVL System with PDBZ Shown -- ZG Output Tracking of TVL and TVN Systems. This book introduces readers to using the simple but effective Zhang-Sommario/riassunto gradient (ZG) method to solve tracking-control problems concerning various nonlinear systems, while also highlighting the applications of the ZG method to tracking control for practical systems, e.g. an inverted-pendulum-on-a-cart (IPC) system and a two-wheeled mobile

robot (showing its potential applications). In addition to detailed theoretical analyses of ZG controllers, the book presents a wealth of computer simulations to demonstrate the feasibility and efficacy of the controllers discussed (as well as the method itself). More importantly,

the superiority of ZG controllers in overcoming the division-by-zero (DBZ) problem is also illustrated. Given its scope and format, the book is well suited for undergraduate and graduate students, as well as academic and industrial researchers in the fields of neural dynamics/neural networks, nonlinear control, computer mathematics, time-varying problem solving, modeling and simulation, analog hardware, and robotics.