1. Record Nr. UNINA9910483615003321

Autore	Díaz-Rodríguez Iván D
Titolo	Analytical Design of PID Controllers / / by Iván D. Díaz-Rodríguez, Sangjin Han, Shankar P. Bhattacharyya
Pubbl/distr/stampa	Cham : , : Springer International Publishing : , : Imprint : Springer, , 2019
ISBN	3-030-18228-2
Edizione	[1st ed. 2019.]
Descrizione fisica	1 online resource (304 pages)
Disciplina	670.427 629.8
Soggetti	Automatic control Chemical engineering Robotics System theory Aerospace engineering Astronautics Control and Systems Theory Industrial Chemistry/Chemical Engineering Systems Theory, Control Aerospace Technology and Astronautics
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Introduction to Control -- Stabilizing Sets for Linear Time Invariant Continuous-Time Plants -- Stabilizing Sets for Ziegler-Nichols Plants -- Stabilizing Sets for Linear Time Invariant Discrete-Time Plants -- Computation of Stabilizing Sets From Frequency Response Data -- Gain and Phase Margin Based Design for Continuous-Time Plants -- Gain-Phase Margin Based Design of Discrete Time Controllers -- PID Control of Multivariable Systems -- H Optimal Synthesis for Continuous-Time Systems -- H Optimal Synthesis for Discrete-Time Systems.
Sommario/riassunto	This monograph presents a new analytical approach to the design of proportional-integral-derivative (PID) controllers for linear time-invariant plants. The authors develop a computer-aided procedure, to

synthesize PID controllers that satisfy multiple design specifications. A geometric approach, which can be used to determine such designs methodically using 2- and 3-D computer graphics is the result. The text expands on the computation of the complete stabilizing set previously developed by the authors and presented here. This set is then systematically exploited to achieve multiple design specifications simultaneously. These specifications include classical gain and phase margins, time-delay tolerance, settling time and H-infinity norm bounds. The results are developed for continuous- and discrete-time systems. An extension to multivariable systems is also included. Analytical Design of PID Controllers provides a novel method of designing PID controllers, which makes it ideal for both researchers and professionals working in traditional industries as well as those connected with unmanned aerial vehicles, driverless cars and autonomous robots. .