

Contents

Part I Tuning for PID Controllers

1	An Overview of Tuning Rules for the PI and PID Continuous-Time Control of Time-Delayed Single-Input, Single-Output (SISO) Processes	3
	Aidan O’Dwyer	
2	Model-Based PI(D) Autotuning	45
	Alberto Leva and Martina Maggio	
3	PI/PID Controllers Design for Integrating and Unstable Systems	75
	A. Seshagiri Rao and M. Chidambaram	
4	Robustness in PID Control	113
	Ramon Vilanova, Víctor M. Alfaro, and Orlando Arrieta	
5	The SIMC Method for Smooth PID Controller Tuning	147
	Sigurd Skogestad and Chriss Grimholt	
6	PID Control for MIMO Processes	177
	Qing-Guo Wang and Zhuo-Yun Nie	

Part II Control Structures and Configurations for PID Control

7	Feedforward Compensation for PID Control Loops	207
	José Luis Guzmán, Tore Hägglund, and Antonio Visioli	
8	Control Structures for Time Delay Systems	235
	Somanath Majhi	
9	Robust Multivariable Tuning Methods	255
	Reza Katebi	

Part III Issues in PID Control Systems

10 Identification for PID Control	283
Kostas S. Tsakalis and Sachi Dash	
11 Modern PID Control: Stabilizing Sets and Multiple Performance Specifications	319
L.H. Keel and S.P. Bhattacharyya	
12 Fragility Evaluation of PI and PID Controllers Tuning Rules	349
V́ctor M. Alfaro and Ramon Vilanova	
13 Benchmarking and Tuning PID Controllers	381
Andrew W. Ordys and Michael J. Grimble	
14 Industrial Applications of PID Control	415
Gregory K. McMillan	

Part IV Non-standard Approaches to PID

15 Fractional-Order PID	465
Blas M. Vinagre and Concepción A. Monje	
16 Event-Based PID Control	495
José Sánchez, Antonio Visioli, and Sebastián Dormido	
17 Data-Driven PID Controller	527
Toru Yamamoto	
18 Predictive Control Approaches for PID Control Design and Its Extension to Multirate System	553
Takao Sato	
Index	597

PID Control in the Third Millennium
Lessons Learned and New Approaches
Vilanova, R.; Visioli, A. (Eds.)
2012, XIV, 602 p., Hardcover
ISBN: 978-1-4471-2424-5