

1. Record Nr.	UNINA9910853989003321
Autore	Xiong Wenjun
Titolo	Iterative Learning Control for Network Systems under Constrained Information Communication
Pubbl/distr/stampa	Springer Nature, 2024 Singapore : , : Springer Singapore Pte. Limited, , 2024 ©2024
ISBN	9789819709267 9819709261
Edizione	[1st ed.]
Descrizione fisica	1 online resource (229 pages)
Collana	Intelligent Control and Learning Systems Series ; ; v.12
Altri autori (Persone)	LuoZijian HoDaniel W. C
Soggetti	Command and control systems Communication in engineering
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di contenuto	Intro -- Preface -- Contents -- Symbols -- 1 Introduction -- 1.1 Iterative Learning Control -- 1.1.1 Current Status of ILC Research -- 1.2 Network Systems -- 1.2.1 Constrained Information Communication -- 1.2.2 Basic Knowledge -- 1.2.3 Notations -- 1.3 Structure of This Monograph -- 1.4 Summary -- References -- 2 Consensus Under Event-Triggered Transmission and Quantization -- 2.1 Introduction -- 2.2 Problem Formulation -- 2.3 ILC Scheme -- 2.3.1 Event-Triggered Transmission and Quantization -- 2.3.2 ILC Scheme Design -- 2.4 Convergence Analysis -- 2.4.1 The Consensus Under Event-Triggered Strategy Without Quantization -- 2.4.2 The Consensus Under Event-Triggered Strategy with Quantization -- 2.5 Simulation Example -- 2.6 Summary -- References -- 3 Consensus Under Limited Information Communication -- 3.1 Introduction -- 3.2 Problem Formulation -- 3.2.1 Quantizer Design -- 3.2.2 ILC Scheme Design -- 3.3 Main Results -- 3.4 Simulation Example -- 3.5 Summary -- References -- 4 Consensus Under Switching Topology and Observer Information -- 4.1 Introduction -- 4.2 Problem Formulation -- 4.3 ILC Scheme -- 4.3.1 Controller Design -- 4.3.2 Initial State Learning Scheme -- 4.4

Convergence Analysis -- 4.5 Simulation Example -- 4.6 Summary -- References -- 5 Tracking Under Measurable and Unmeasurable State Information -- 5.1 Introduction -- 5.2 Problem Formulation -- 5.3 Sampling Protocols and ILC Schemes -- 5.3.1 Two Types of Sampling Protocols -- 5.3.2 Two Types of ILC Design -- 5.4 Convergence Analysis -- 5.4.1 Tracking with Measurability of the States -- 5.4.2 Tracking with Immeasurability of the States -- 5.5 Simulation Example -- 5.6 Summary -- References -- 6 Tracking Under Saturated Finite Interval and HNN-Structural Output -- 6.1 Introduction -- 6.2 Problem Formulation -- 6.2.1 ILC Design -- 6.2.2 Definitions and Lemmas -- 6.3 Convergence Analysis.

6.3.1 Convergence Under Interval ILC Scheme -- 6.3.2 Convergence Under Saturated Interval ILC Scheme -- 6.4 Simulation Examples -- 6.5 Summary -- References -- 7 Tracking Based on Discontinuous Learning Control Strategy -- 7.1 Introduction -- 7.2 Problem Formulation -- 7.3 Finite-Time Tracking with Impulsive ILC -- 7.3.1 Control Strategy Design -- 7.3.2 Convergence Analysis -- 7.4 Finite-Time Tracking with ZOH Sampled-Data ILC -- 7.4.1 Control Strategy Design -- 7.4.2 Convergence Analysis -- 7.5 Simulation Example -- 7.6 Summary -- References -- 8 Finite-Iteration Learning Tracking with Packet Losses -- 8.1 Introduction -- 8.2 Problem Formulation -- 8.3 ILC Scheme -- 8.4 Main Results -- 8.4.1 The Finite-Iteration Tracking Without the Packet Dropout -- 8.4.2 The Finite-Iteration Tracking with the Packet Dropout -- 8.5 Simulation Example -- 8.6 Summary -- References -- 9 Finite-Iteration Learning Tracking with FlexRay Communication Protocol -- 9.1 Introduction -- 9.2 Problem Formulation -- 9.3 ILC Scheme Under FlexRay Protocol -- 9.4 Main Results -- 9.5 Simulation Example -- 9.6 Summary -- References -- 10 Multi-layered Sampled-Data Tracking Under Cooperative-Antagonistic Interactions -- 10.1 Introduction -- 10.2 Problem Formulation -- 10.2.1 Model Description -- 10.2.2 ILC Scheme Design -- 10.3 Main Results -- 10.3.1 Convergence Analysis with Cooperative-Antagonistic ILC Scheme -- 10.3.2 Convergence Analysis with Cooperative-Antagonistic Sampled-Data ILC Scheme -- 10.4 Simulation Example -- 10.5 Summary -- References -- 11 Stability of Multi-layer Supply Chain Networks with Constraints -- 11.1 Introduction -- 11.2 Problem Formulation -- 11.2.1 Model Description -- 11.2.2 Constraints of States and Objectives -- 11.3 Control Strategy with Limitations -- 11.4 Main Results -- 11.4.1 Learning Control Scheme Analysis -- 11.4.2 Convergence Analysis.

11.5 Simulation Example -- 11.6 Summary -- References -- 12 Security of Network Systems Under Cyber-Attack -- 12.1 Introduction -- 12.2 Problem Formulation -- 12.3 ILC Scheme Design -- 12.4 Main Results -- 12.4.1 Robust Convergence Analysis -- 12.4.2 Boundedness of All System Trajectories -- 12.5 Simulation Example -- 12.6 Summary -- References.

---

#### Sommario/riassunto

This book focuses on the application of iterative learning control (ILC) techniques to networked systems with communication constraints. It addresses the challenges posed by complex network structures, such as data dropout and quantization, and explores solutions using ILC methods. The book is structured into 12 chapters, covering topics like consensus problems under limited information and tracking issues under various constraints like packet losses and switching topology. It is aimed at students, academics, and engineers in fields such as networked systems and control engineering, offering insights into both theoretical foundations and practical applications.

---