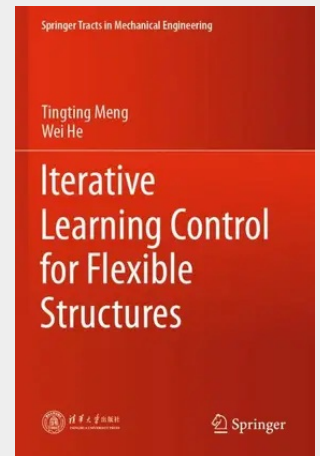


Iterative Learning Control for Flexible Structures

This book presents iterative learning control (ILC) to address practical issues of flexible structures. It is divided into four parts: Part I provides a general introduction to ILC and flexible structures, while Part II proposes various types of ILC for simple flexible structures to address issues such as vibration, input saturation, input dead-zone, input backlash, external disturbances, and trajectory tracking. It also includes simple partial differential equations to deal with the common problems of flexible structures. Part III discusses the design of ILC for flexible micro aerial vehicles and two-link manipulators, and lastly, Part IV offers a summary of the topics covered. Unlike most of the literature on ILC, which focuses on ordinary differential equation systems, this book explores distributed parameter systems, which are comparatively less stabilized through ILC. Including a comprehensive introduction to ILC of flexible structures, it also examines novel approaches used in ILC to address input constraints and disturbance rejection. This book is intended for researchers, graduate students and engineers in various fields, such as flexible structures, external disturbances, nonlinear inputs and tracking control.

Introduction.- Boundary Iterative Learning Control.- ILC for the Vibration Suppression in the Transverse Motion and Rotation.- ILC for the Nonlinearities of Differentiable and Non-Differentiable Inputs.- ILC for the Rejection of Time-Varying and Spatiotemporally Varying Disturbances.- Adaptive ILC for an Euler-Bernoulli Beam with Uncertainties.- ILC for Constant and Varying Trajectories Tracking.- ILC for a Flapping Wing Micro Aerial Vehicle.- ILC for a Flexible Two-Link Manipulator with PDE Model.- Conclusions.



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