

1. Record Nr.	UNINA9910254200303321
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Titolo	Active Structural Control with Stable Fuzzy PID Techniques // by Wen Yu, Suresh Thenozhi
Pubbl/distr/stampa	Cham : , : Springer International Publishing : , : Imprint : Springer, , 2016
ISBN	3-319-28025-2
Edizione	[1st ed. 2016.]
Descrizione fisica	1 online resource (129 p.)
Collana	SpringerBriefs in Applied Sciences and Technology, , 2191-530X
Disciplina	624.17
Soggetti	Automatic control Buildings—Design and construction Building Construction Engineering, Architectural Computational intelligence Vibration Dynamics Control and Systems Theory Building Construction and Design Computational Intelligence Vibration, Dynamical Systems, Control
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references at the end of each chapters.
Nota di contenuto	Introduction -- Active Structural Control -- Position and Velocity Estimation -- Stable PID Active Control of Building Structures -- Fuzzy PID Control of Building Structures -- Fuzzy Sliding-Mode Control for Wind-Induced Vibration -- Conclusions.
Sommario/riassunto	This book presents a detailed discussion of intelligent techniques to measure the displacement of buildings when they are subjected to vibration. It shows how these techniques are used to control active devices that can reduce vibration 60–80% more effectively than widely used passive anti-seismic systems. After introducing various structural control devices and building-modeling and active structural control

methods, the authors propose offset cancellation and high-pass filtering techniques to solve some common problems of building-displacement measurement using accelerometers. The most popular control algorithms in industrial settings, PD/PID controllers, are then analyzed and then combined with fuzzy compensation. The stability of this combination is proven with standard weight-training algorithms. These conditions provide explicit methods for selecting PD/PID controllers. Finally, fuzzy-logic and sliding-mode control are applied to the control of wind-induced vibration. The methods described are supported by reports of experimental studies on a two-story building prototype. This book is a valuable resource for academic researchers interested in the effects of control and mechatronic devices within buildings, or those studying the principles of vibration reduction. Practicing engineers working on the design and construction of any sort of high-rise or vulnerable building and concerned with the effects of either wind or seismic disturbances benefit from the efficacy of the methods proposed.
