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	Titolo	Control and Optimization Methods for Complex System Resilience / / by Chao Zhai
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	Descrizione fisica	1 online resource (218 pages)
	Collana	Studies in Systems, Decision and Control, , 2198-4190 ; ; 478
	Disciplina	629.8
	Soggetti	Automatic control
		Robotics
		Automation
		Cooperating objects (Computer systems)
		Control, Robotics, Automation
		Cyber-Physical Systems
		Control and Systems Theory
	Lingua di pubblicazione	Inglese
	Formato	Materiale a stampa
	Livello bibliografico	Monografia
	Nota di contenuto	Introduction to Complex System Resilience -- Optimal Control Approach to Identifying Cascading Failures -- Jacobian-free Newton-Krylov Method for Risk Identification -- Security Monitoring using Converse Lyapunov Function -- Online Gaussian Process Learning for Security Assessment -- Risk Identification of Cascading Process under Protection -- Model Predictive Approach to Preventing Cascading Process -- Robust Optimization Approach to Uncertain Cascading Process -- Cooperative Control Methods for Relieving System Stress -- Distributed Optimization Approach to System Protection -- Reinforcement Learning Approach to System Recovery -- Summary and Future Work.
	Sommario/riassunto	This book provides a systematic framework to enhance the ability of complex dynamical systems in risk identification, security assessment, system protection, and recovery with the assistance of advanced control and optimization technologies. By treating external disturbances as control inputs, optimal control approach is employed to identify disruptive disturbances, and online security assessment is

conducted with Gaussian process and converse Lyapunov function. Model predictive approach and distributed optimization strategy are adopted to protect the complex system against critical contingencies. Moreover, the reinforcement learning method ensures the efficient restoration of complex systems from severe disruptions. This book is meant to be read and studied by researchers and graduates. It offers unique insights and practical methodology into designing and analyzing complex dynamical systems for resilience elevation.