

1. Record Nr.	UNINA9910879585403321
Autore	Nagahara Masaaki
Titolo	Control of Multi-agent Systems : Theory and Simulations with Python / / by Masaaki Nagahara, Shun-Ichi Azuma, Hyo-Sung Ahn
Pubbl/distr/stampa	Cham : , : Springer International Publishing : , : Imprint : Springer, , 2024
ISBN	3-031-52981-2
Edizione	[1st ed. 2024.]
Descrizione fisica	1 online resource (244 pages)
Collana	Advanced Textbooks in Control and Signal Processing, , 2510-3814
Disciplina	629.8312
Soggetti	Automatic control Graph theory Artificial intelligence Robotics Control and Systems Theory Graph Theory Artificial Intelligence
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di contenuto	Introduction -- Linear Algebra and Graph Theory -- Consensus Control -- Coverage Control -- Formation Control -- Distributed Optimization -- Viral Spreading Phenomena and Control.
Sommario/riassunto	This textbook teaches control theory for multi-agent systems. Readers will learn the basics of linear algebra and graph theory, which are then developed to describe and solve multi-agent control problems. The authors address important and fundamental problems including: • consensus control; • coverage control; • formation control; • distributed optimization; and • the viral spreading phenomenon. Students' understanding of the core theory for multi-agent control is enhanced through worked examples and programs in the popular Python language. End-of-chapter exercises are provided to help assess learning progress. Instructors who adopt the book for their courses can download a solutions manual and the figures in the book for lecture slides. Additionally, the Python programs are available for download and can be used for experiments by students in advanced

undergraduate or graduate courses based on this text. The broad spectrum of applications relevant to this material includes the Internet of Things, cyber-physical systems, robot swarms, communications networks, smart grids, and truck platooning. Additionally, in the spheres of social science and public health, it applies to opinion dynamics and the spreading of viruses in social networks. Students interested in learning about such applications, or in pursuing further research in multi-agent systems from a theoretical perspective, will find much to gain from Control of Multi-agent Systems. Instructors wishing to teach the subject will also find it beneficial.
