1. Record Nr. UNINA9910300378903321

Titolo	Networks of Networks: The Last Frontier of Complexity / / edited by Gregorio D'Agostino, Antonio Scala
Pubbl/distr/stampa	Cham : , : Springer International Publishing : , : Imprint : Springer, , 2014
ISBN	3-319-03518-5
Edizione	[1st ed. 2014.]
Descrizione fisica	1 online resource (XII, 340 p. 147 illus., 126 illus. in color.)
Collana	Understanding Complex Systems, , 1860-0832
Disciplina	621
Soggetti	Physics Computational complexity System theory Economic theory Applications of Graph Theory and Complex Networks Complexity Complex Systems Economic Theory/Quantitative Economics/Mathematical Methods
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Bibliographic Level Mode of Issuance: Monograph
Nota di contenuto	Part I Theoretical Approaches -- Network of Interdependent Networks: Overview of Theory and Applications (18 April 2013) -- Avalanches in Multiplex and Interdependent Networks -- Multiple Networks -- Modeling Interconnected Networks as Random Graphs: Connectivity and Systemic Risk -- Thresholds and Complex Dynamics of Interdependent Cascading Infrastructure Systems -- Part II Applications -- Characterizing Relevant Network Structure with Reliability Polynomials -- Spatial Effects: Transport on Interdependent Networks -- Electrical Networks – An Introduction -- Smart Grid as Multi-Layer Interacting System for Complex Decision Makings -- Network Physiology: Mapping Interactions between Networks of Physiologic Networks -- Part III Phenomenological Models -- Federated Modelling and Simulation for Critical Infrastructure Protection -- Multisystem Simulation: Analysis of Critical Infrastructures for Disaster Response -- Addressing Interdependencies of Complex Technical Networks --

Financial Networks -- Spatial-Temporal Quantification of Interdependencies Across Infrastructure Networks -- Index.

Sommario/riassunto

The present work is meant as a reference to provide an organic and comprehensive view of the most relevant results in the exciting new field of Networks of Networks (NetoNets). Seminal papers have recently been published posing the basis to study what happens when different networks interact, thus providing evidence for the emergence of new, unexpected behaviors and vulnerabilities. From those seminal works, the awareness on the importance understanding Networks of Networks (NetoNets) has spread to the entire community of Complexity Science. The reader will benefit from the experience of some of the most well-recognized leaders in this field. The contents have been aggregated under four headings; General Theory, Phenomenology, Applications and Risk Assessment. The reader will be impressed by the different applications of the general paradigm that span from physiology, to financial risk, to transports. We are currently making the first steps to reduce the distance between the language and the way of thinking of the two communities of experts in real infrastructures and the complexity scientists. Although this path may prove to be long, it is extremely promising, both in extending our understanding of complex systems and in finding concrete applications that can enhance the life quality of millions of people.