



Complex Systems and Networks : Dynamics, Controls and Applications /

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This elementary book provides some state-of-the-art research results on broad disciplinary sciences on complex networks. It presents an in-depth study with detailed description of dynamics, controls and applications of complex networks. The contents of this book can be summarized as follows. First, the dynamics of complex networks, for example, the cluster dynamic analysis by using kernel spectral methods, community detection algorithms in bipartite networks, epidemiological modeling with demographics and epidemic spreading on multi-layer networks, are studied. Second, the controls of complex networks are investigated including topics like distributed finite-time cooperative control of multi-agent systems by applying homogenous-degree and Lyapunov methods, composite finite-time containment control for disturbed second-order multi-agent systems, fractional-order observer design of multi-agent systems, chaos control and anticontrol of complex systems via Parrondos game and many more. Third, the applications of complex networks provide some applicable carriers, which show the importance of theories developed in complex networks. In particular, a general model for studying time evolution of transition networks, deflection routing in complex networks, recommender systems for social networks analysis and mining, strategy selection in networked evolutionary games, integration and methods in computational biology, are discussed in detail.

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