Matthias Dehmer, Frank Emmert-Streib, Alexander Mehler (Eds.)

Towards an Information Theory of Complex Networks

Statistical Methods and Applications

- First book on the market giving a comprehensive look at the applications of information-theoretic models for complex networks
- Synthesizes graph-theoretic, statistical, and information-theoretic methods to effectively understand and characterize real-world networks
- Addresses a broad range of disciplines, including quantitative biology, quantitative chemistry, quantitative sociology, and quantitative linguistics
- Caters to both researchers and scholars across the sciences

For over a decade, complex networks have steadily grown as an important tool across a broad array of academic disciplines, with applications ranging from physics to social media. A tightly organized collection of carefully-selected papers on the subject, Towards an Information Theory of Complex Networks: Statistical Methods and Applications presents theoretical and practical results about information-theoretic and statistical models of complex networks in the natural sciences and humanities. The book's major goal is to advocate and promote a combination of graph-theoretic, information-theoretic, and statistical methods as a way to better understand and characterize real-world networks. This volume is the first to present a self-contained, comprehensive overview of information-theoretic models of complex networks with an emphasis on applications. As such, it marks a first step toward establishing advanced statistical information theory as a unified theoretical basis of complex networks for all scientific disciplines and can serve as a valuable resource for a diverse audience of advanced students and professional scientists. While it is primarily intended as a reference for research, the book could also be a useful supplemental graduate text in courses related to information science, graph theory, machine learning, and computational biology, among others.

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