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/ Faloutsos, P. / Faloutsos, C. -- Classes of small-world networks / Amara, L.A.N. / Scala, A. / Barthelemy, M. / Stanley, H.E. -- The large-scale organization of metabolic networks / Jeong, H. / Tombort, B. / Albert, R. / Oltvai, L.N. / Barabási, A.-L. -- The small world of metabolism / Felland, David A. / Wagner, Andreas -- Network Motifs: Simple Building Blocks of Complex Networks / Milo, R. / Shen-Orr, S. / Itzkovitz, S. / Kashtan, N. / Chklovskii, D. / Alon, U. -- The structure of scientific collaboration networks / Newman, M.E.J. -- The web of human sexual contacts / Liljeros, F. -- Chapter 4. Models of networks -- 4.1 RANDOM GRAPH MODELS -- A Critical Point for Random Graphs with a Given Degree Sequence / Molloy, Michael / Reed, Bruce -- A Random Graph Model for Massive Graphs / Aiello, W. / Chung, F. / Lu, L. -- Random graphs with arbitrary degree distributions and their applications / Newman, M.E.J. / Strogatz, S.H. / Watts, D.J. -- 4.2 THE SMALL-WORLD MODEL -- Collective dynamics of 'small-world' networks / Watts, Duncan J. / Strogatz, Steven H. -- Small-World Networks: Evidence for a Crossover Picture / Barthélemy, M. / Amaral, L.A.N. -- Comment on "Small-world networks: Evidence for crossover picture" / Barrat, A. -- Scaling and percolation in the small-world network model / Newman, M.E.J. / Watts, D.J. -- On the properties of small-world network models / Barrat, A. / Weigt, M. -- 4.3 MODELS OF SCALE-FREE NETWORKS -- Emergence of Scaling in Random Networks / Barabási, A.-L. / Albert, R. -- Structure of Growing Networks with Preferential Linking / Dorogovtsev, S.N. / Mendes, J.F.F. / Samukhin, A.N. -- Connectivity of Growing Random Networks / Krapivsky, P.L. / Redner, S. / Leyvraz, F. -- Competition and multiscaling in evolving networks / Bianconi, G. / Barabási, A.-L. -- Universal Behavior of Load Distribution in Scale-Free Networks / Uoh, K.-I. / Kahng, B. / Kim, D. -- Spectra of "real-world" graphs: Beyond the semicircle law / Farkas, Illes J. / Derenyi, Imre / Barabási, A.-L. / Vicsek, Tamas -- The Degree Sequence of a Scale-Free Random Graph Process / Bollobás, Béla / Riordan, Oliver / Spencer, Joel / Tusnády, Gábor -- A MODEL OF LARGE-SCALE PROTEOME EVOLUTION / Solé, Ricard V. / Pastor-Satorras, Romualdo / Smith, Eric / Kepler, Thomas B. -- Modeling of Protein Interaction Networks / Vázquez, A. / Flammini, A. / Maritan, A. / Vespignani, A. -- Chapter Five. Applications -- 5.1 EPIDEMICS AND RUMORS -- 5.2 ROBUSTNESS OF NETWORKS -- 5.3 SEARCHING NETWORKS -- EPIDEMICS WITH TWO LEVELS OF MIXING / Ball, Frank / Mollison, Denis / Scallia-Tomba, Gianpaolo -- The effects of local spatial structure on epidemiological invasions / Keeling, M.J. -- Small World Effect in an Epidemiological Model / Kupennan, Marcelo / Abramson, Guillermo -- Epidemic Spreading in Scale-Free Networks / Pastor-Satorras, Romualdo / Vespignani, Alessandro -- A simple model of global cascades on random networks / Watts, Duncan J. -- Error and attack tolerance of complex networks / Albert, Réka / Jeong, Hawoong / Barabási, Albert-Laszlo -- Resilience of the Internet to Random Breakdowns / Cohen, Reuven / Erez, Keren / , Daniel / Havlin, Shlomo -- Network Robustness and Fragility: Percolation on Random Graphs / Callaway, Duncan S. / Newman, M.E.J. / Strogatz, Steven H. / Watts, Duncan J. -- Authoritative Sources in a Hyperlinked Environment / Kleinberg, Jon M. -- Search in power-law networks / Adamic, L. A. / Lukose, R. M. / Puniyani, A. R. / Huberman, B. A. -- Navigation in a small world / Kleinberg, J. M. -- Chapter Six. Outlook -- References -- Index

## Sommario/riassunto

From the Internet to networks of friendship, disease transmission, and even terrorism, the concept--and the reality--of networks has come to pervade modern society. But what exactly is a network? What different types of networks are there? Why are they interesting, and what can

they tell us? In recent years, scientists from a range of fields--including mathematics, physics, computer science, sociology, and biology--have been pursuing these questions and building a new "science of networks." This book brings together for the first time a set of seminal articles representing research from across these disciplines. It is an ideal sourcebook for the key research in this fast-growing field. The book is organized into four sections, each preceded by an editors' introduction summarizing its contents and general theme. The first section sets the stage by discussing some of the historical antecedents of contemporary research in the area. From there the book moves to the empirical side of the science of networks before turning to the foundational modeling ideas that have been the focus of much subsequent activity. The book closes by taking the reader to the cutting edge of network science--the relationship between network structure and system dynamics. From network robustness to the spread of disease, this section offers a potpourri of topics on this rapidly expanding frontier of the new science.

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